

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL 10,0 y1
 Edition : 02.10.89
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 401 846 903
 Injection pump
 Pump designation : PE6P110A320RS3080-5
 EP type number : 0 411 816 767
 Governor
 Governor design. : RQV250...950PA921-19
 Governor no. : 0 421 813 802

Customer-spec. information
 Customer : VOLVO-TRUCK

Engine : TD102FM

1st version kW : 235.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10
 : (2.95...3.15)

Rack travel in mm : 9.00...12.00

AD1

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.20...13.30

Del.quantity cm3/ : 19.6...19.8

100 s: (19.4...20.0)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 3.7...3.9

Del.quantity cm3/ : 1.2...1.6

100 s: (0.9...1.9)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.00...1.40

2nd speed rpm : 350

travel mm : 2.20...2.80

3rd speed rpm : 750

travel mm : 6.30...6.70

4th speed rpm : 995

travel mm : 8.20...8.40

5th speed rpm : 1060

travel mm : 9.30...9.70

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1000

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 196.0...198.0

1000 : (194.0...200.0)

Spread cm³ : 4.00
1000 : (7.50)

RATED SPEED

1st version
Control lever
position degrees: 61...69

Testing:

1st rack travel in: 12.20
Speed rpm : 990...1000
2nd rack travel in: 4.00
Speed rpm : 1050...1080
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 4...12

Testing:

Speed rpm : 100
Minimum rack travel: 5.30
Speed rpm : 250
Rack travel in mm : 3.70...3.90

CONSTANT REGULATION

Speed rpm : 250...360

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 13.20...13.30

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.90...10.10
2nd pressure hPa : 90
Rack travel in m: 10.20...10.30
3rd pressure hPa : 680
Rack travel in m: 12.80...13.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -
Speed rpm : 700
Del.quantity cm³/ : 134.5...136.5
1000 s: (131.5...139.5)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 12.20
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 160.0...190.0
1000 s: (156.0...194.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250
Rack travel in mm : 3.70...3.90
Del.quantity cm³/ : 12.0...16.0
1000 s: (9.5...19.5)
Spread cm³ : 3.00
1000 s: (6.00)

Remarks:

Delivery-valve spring pre-tension =
2.40...2.60 mm.
Permissible alteration from 2.20...2.90
mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 8,3 p 2
 Edition : 02.10.89
 Replaces : 28.6.89
 Test oil : ISO-4113
 Combination no. : 0 401 846 905
 Injection pump
 Pump designation : PE6P110A720RS3225-1
 EP type number : 0 411 816 762
 Governor
 Governor design. : RQ250/1200PA913
 Governor no. : 0 421 801 477

Customer-spec. information
 Customer : DAF

Engine : HT 168

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.40...12.50

Del.quantity cm3/ : 12.0...12.2

100 s: (11.7...12.4)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 7.2...7.4

Del.quantity cm3/ : 1.4...1.9

100 s: (1.1...2.1)

Spread cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 120.0...122.0

1000 : (117.5...124.5)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 15.8

Testing:

1st rack travel in: 11.40

Speed rpm : 1235...1250

2nd rack travel in: 4.00

Speed rpm : 1325...1355

4th rack travel in: 1400

Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 250
Rack travel in mm : 5.8

Testing:

Speed rpm : 100
Minimum rack travel: 8.00
Speed rpm : 250
Rack travel in mm : 5.70...5.90
Rack travel in mm : 2.00
Speed rpm : 330...370

TORQUE CONTROL

Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 1000
Rack travel in m: 12.70...12.80
2nd speed rpm : 1200
Rack travel in m: 12.60...12.80

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 600
Pressure hPa : 1000
Rack travel mm : 12.40...12.50

Measurement

Speed 1/min : 600

1st pressure hPa : -

Rack travel in m: 10.80...10.90

2nd pressure hPa : 395

Rack travel in m: 12.00...12.10

3rd pressure hPa : 320

Rack travel in m: 11.50...11.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 600

Del.quantity cm³/ : 83.5...85.5

1000 s: (81.0...88.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.40

Speed rpm : 1235...1250

LOW IDLE

Speed rpm : 250

A04

Rack travel in mm : 5.70...5.90

Remarks:

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BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 8,3 p 5
 Edition : 09.11.89
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 401 846 905
 Injection pump
 Pump designation : PE6P110A720RS3225Z
 EP type number : 0 411 816 762
 Governor
 Governor design. : RQ250/1200PA913
 Governor no. : 0 421 801 477

Customer-spec. information
 Customer : DAF

Engine : HT 168

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.30...12.40

Del.quantity cm3/ : 12.0...12.2

100 s: (11.7...12.4)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 7.2...7.4

Del.quantity cm3/ : 1.4...1.9

100 s: (1.1...2.1)

Spread cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 120.0...122.0

1000 : (117.5...124.5)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 15.8

Testing:

1st rack travel in: 11.30

Speed rpm : 1235...1250

2nd rack travel in: 4.00

Speed rpm : 1300...1330

4th rack travel in: 1400

Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 250
Rack travel in mm : 5.8

Testing:

Speed rpm : 100
Minimum rack travel: 8.00
Speed rpm : 250
Rack travel in mm : 5.70...5.90
Rack travel in mm : 2.00
Speed rpm : 320...360

TORQUE CONTROL

Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 1000
Rack travel in m: 12.60...12.70
2nd speed rpm : 1200
Rack travel in m: 12.50...12.70

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 600
Pressure hPa : 1000
Rack travel mm : 12.30...12.40

Measurement

Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 10.80...10.90
2nd pressure hPa : 395
Rack travel in m: 12.00...12.10
3rd pressure hPa : 320
Rack travel in m: 11.50...11.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 600
Del.quantity cm³/ : 83.5...85.5
1000 s: (81.0...88.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.30
Speed rpm : 1235...1250

LOW IDLE

Speed rpm : 250

A06

Rack travel in mm : 5.70...5.90

Remarks:

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BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 8,3 p 3
 Edition : 02.10.89
 Replaces : 23.6.89
 Test oil : ISO-4113
 Combination no. : 0 401 846 906
 Injection pump
 Pump designation : PE6P110A720RS3225-1
 EP type number : 0 411 816 762
 Governor
 Governor design. : RQV250...1200PA910
 Governor no. : 0 421 813 746

Customer-spec. information
 Customer : DAF

Engine : HT 200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.40...12.50

Del.quantity cm³/ : 12.0...12.2

100 s: (11.7...12.4)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 7.2...7.4

Del.quantity cm³/ : 1.4...1.9

100 s: (1.1...2.1)

Spread cm³ : 0.4

100 s: (0.7)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
 travel mm : 1.00...1.40

2nd speed rpm : 450
 travel mm : 2.90...3.30

3rd speed rpm : 800
 travel mm : 4.70...5.10

4th speed rpm : 1200
 travel mm : 7.80...8.00

5th speed rpm : 1500
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1

Speed rpm : 1235

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 120.0...122.0

1000 : (117.5...124.5)

Spread cm³ : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever
position degrees: 50...58

Testing:

1st rack travel in: 11.40
Speed rpm : 1240...1250
2nd rack travel in: 4.00
Speed rpm : 1335...1365
4th rack travel in: 1450
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 13...21

Testing:

Speed rpm : 100
Minimum rack travel: 8.00
Speed rpm : 250
Rack travel in mm : 5.70...5.90

CONSTANT REGULATION

Speed rpm : 280...400

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 600
Pressure hPa : 1000
Rack travel mm : 12.40...12.50

Measurement

Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 10.80...10.90
2nd pressure hPa : 395
Rack travel in m: 12.00...12.10
3rd pressure hPa : 320
Rack travel in m: 11.50...11.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 600
Del.quantity cm³/ : 83.5...85.5
1000 s: (81.0...88.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.40

A08

Speed rpm : 1240...1250

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.70...5.90

Remarks:

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BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 8,3 p 6
 Edition : 09.11.89
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 401 846 906
 Injection pump
 Pump designation : PE6P110A720RS3225Z
 EP type number : 0 411 816 762
 Governor
 Governor design. : RQV275...1200PA910
 Governor no. : 0 421 813 746

Customer spec. information
 Customer : DAF

Engine : HT 200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.30...12.40

Del.quantity cm³/ : 12.0...12.2

100 s: (11.7...12.4)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 275.0

Rack travel in mm : 7.2...7.4

Del.quantity cm³/ : 1.4...1.9

100 s: (1.1...2.1)

Spread cm³ : 0.4

100 s: (0.7)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
 travel mm : 1.00...1.40

2nd speed rpm : 450
 travel mm : 2.90...3.30

3rd speed rpm : 800
 travel mm : 4.70...5.10

4th speed rpm : 1200
 travel mm : 7.80...8.00

5th speed rpm : 1500
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1235

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 120.0...122.0

1000 : (117.5...124.5)

Spread cm³ : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever
position degrees: 50...58

Testing:

1st rack travel in: 11.30
Speed rpm : 1240...1250
2nd rack travel in: 4.00
Speed rpm : 1335...1365
4th rack travel in: 1450
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 13...21

Testing:

Speed rpm : 100
Minimum rack travel: 8.00
Speed rpm : 275
Rack travel in mm : 5.70...5.90

CONSTANT REGULATION

Speed rpm : 280...400

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 600
Pressure hPa : 1000
Rack travel mm : 12.30...12.40

Measurement

Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 10.80...10.90
2nd pressure hPa : 395
Rack travel in m: 12.00...12.10
3rd pressure hPa : 320
Rack travel in m: 11.50...11.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -
Speed rpm : 600
Del.quantity cm³/ : 83.5...85.5
1000 s: (81.0...88.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.30

A10

Speed rpm : 1240...1250

LOW IDLE

Speed rpm : 275
Rack travel in mm : 5.70...5.90

Remarks:

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BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,0 L 5
Edition : 06.10.89
Replaces : 3.7.89
Test oil : ISO-4113

Combination no. : 0 401 846 907

Injection pump
Pump designation : PE6P120A320LS3815-13
EP type number : 0 411 826 782
Governor
Governor design. : RQV350..1050PA925
Governor no. : 0 421 813 764

Customer-spec. information
Customer : DAIMLER-BENZ

Engine : OM 441 A

1st version kW : 191.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 100...120

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
x Wall thickness
x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70
: (3.55...3.75)
Rack travel in mm : 9.00...12.00
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.70...11.80

Del.quantity cm³/ : 18.8...19.0

100 s: (18.5...19.3)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 350.0
Rack travel in mm : 4.6...5.2
Del.quantity cm³/ : 1.4...2.2
100 s: (1.1...2.5)

Spread cm³ : 0.8
100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350
travel mm : 1.40...1.60

2nd speed rpm : 800
travel mm : 4.70...5.10

3rd speed rpm : 1100
travel mm : 7.60...8.20

4th speed rpm : 1175
travel mm : 9.20...9.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1080

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1050

Aneroid pressure h: 900
Del.quantity : 188.0...190.0
1000 : (185.0...193.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 60...68

Testing:
1st rack travel in: 10.70
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1150...1180
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 10...14

Testing:
Speed rpm : 250
Minimum rack travel: 8.00
Speed rpm : 350
Rack travel in mm : 4.60...5.20

CONSTANT REGULATION
Speed rpm : 350...550

TORQUE CONTROL
Dimension a mm : 1.30
Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 11.70...11.90
2nd speed rpm : 950
Rack travel in m: 12.40...12.60
3rd speed rpm : 850
Rack travel in m: 12.60...12.80

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.30...9.50

Measurement
Speed 1/min : 500

1st pressure hPa : 400
Rack travel in m: 10.10...10.30
2nd pressure hPa : 600
Rack travel in m: 11.70...12.10

START CUT-OUT

Speed 1/min : 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 800
Del.quantity cm3/ : 211.0...215.0
1000 s: (208.0...218.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: 900
Speed rpm : 1050
Del.quantity cm3/ : 155.0...157.0 *
1000 s: (152.0...160.0)
Spread cm3 : -
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 127.0...129.0
1000 s: (124.0...132.0)
Spread cm3 : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.70
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 190.0...210.0
1000 s: (186.0...214.0)

Remarks:

:

* = Set at reduced-delivery stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,0 s17
Edition : 15.08.89
Replaces : 23.6.89
Test oil : ISO-4113

Combination no. : 0 401 846 909

Injection pump
Pump designation : PE6P110A320LS3835-2
EP type number : 0 411 816 761
Governor
Governor design. : RQV350...1050PA378-10
Governor no. : 0 421 813 765

Customer-spec. information
Customer : DAIMLER-BENZ

Engine : OM 441

1st version kW : 160.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 100...120

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10
 : (3.95...4.15)
Rack travel in mm : 9.00...12.00
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.90...13.00

Del.quantity cm³/ : 13.8...14.0

100 s: (13.5...14.2)

Spread cm³ : 0.4

100 s: (0.8)

2nd speed rpm : 350.0

Rack travel in mm : 7.8...8.2

Del.quantity cm³/ : 1.2...1.8

100 s: (0.9...2.0)

Spread cm³ : 0.4

100 s: (0.7)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.10...1.30

2nd speed rpm : 500

travel mm : 3.50...3.80

3rd speed rpm : 1100

travel mm : 8.00...8.50

4th speed rpm : 1150

travel mm : 9.20...9.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1080

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Del.quantity : 138.0...140.0

1000 : (135.5...142.5)

Spread cm³ : 4.00
1000 : (8.00)

Remarks:

:

RATED SPEED

1st version
Control lever
position degrees: 61...69

Testing:

1st rack travel in: 11.90
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1135...1165
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 11...19

Testing:

Speed rpm : 200
Minimum rack travel: 9.50
Speed rpm : 350
Rack travel in mm : 7.80...8.20

CONSTANT REGULATION

Speed rpm : 350...550

START CUT-OUT

Speed 1/min : 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750
Del.quantity cm³/ : 125.0...129.0
1000 s: (122.0...132.0)
Spread cm³ : 6.00
1000 s: (8.00)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.90
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 140.0...160.0
1000 s: (136.0...164.0)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE 10,1 d8
 Edition : 24.08.89
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 076 032
 Injection pump
 Pump designation : PES6P110A720RS296
 EP type number : 0 412 016 037
 Governor
 Governor design. : RSV400...1050PO/426D
 R
 Governor no. : 0 421 835 082

Customer-spec. information
 Customer : JOHN DEERE

Engine : 6619 A

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., C : 38...42

Overflow valve
 : 1 457 413 010

Inlet press., bar : 1.5

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 9 681 230 706

Outside diameter
 x Wall thickness
 x Length mm : 6,00X2,00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Prestroke mm : 2,75...2,85
 : (2,70...2,90)
 Rack travel in mm : 9,00...12,00
 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
 Tolerance + - , : 0,50 (0,75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12,20

Del.quantity cm³/ : 17,2...17,4

100 s : (-)

Spread cm³ : 0,4

100 s : (-)

2nd speed rpm : 400

Rack travel in mm : 6,80

Del.quantity cm³/ : 1,9...2,5

100 s : (-)

Spread cm³ : 0,4

100 s : (-)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0,30...0,70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Del.quantity : 172,0...174,0

1000 : (-)

Spread cm³ : 4,0

1000 : (-)

RATED SPEED

1st version

Control lever

position degrees: 36...44

Testing:

1st rack travel in: 11,20

Speed rpm : 1095...1105

2nd rack travel in: 5,90

Speed rpm : 1135...1165

LOW IDLE 1

Control lever

position degrees: 15...23

Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 6,30

Testing:

Speed rpm : 100
Minimum rack trave: 19,00
Speed rpm : 400
Rack travel in mm : 6,70...6,90
Rack travel in mm : 2,00
Speed rpm : 520...580

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 630
Rack travel in m: 12,60

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 273,2
Rack travel mm : 9,65...9,75

Measurement

Speed 1/min : 500

1st pressure hPa : 526,5
Rack travel in m: 11,30...1,90

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 650
Del.quantity cm3/ : 177,0...180,0
1000 s: (-)
Spread cm3 : 6,0
1000 s: (-)
Speed rpm : 550
Del.quantity cm3/ : 84,0...92,0
1000 s: (-)
Spread cm3 : 6,0
1000 s: (-)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11,20
Speed rpm : 1095...1105

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 170,0
1000 s: (-)
Rack travel in mm : 19,00...21,00

HIGH IDLE

1st version

Speed rpm : 1150
Rack travel in mm : 5,90
Del.quantity cm3/ : 47,0...57,0
1000 s: (-)
Spread cm3 : 6,0
1000 s: (-)

LOW IDLE

Speed rpm : 400
Rack travel in mm : 6,80
Del.quantity cm3/ : 19,0...25,0
1000 s: (-)
Spread cm3 : 4,0
1000 s: (-)

Remarks:

Start-of-delivery mark at control-rod
travel 10.5 mm and 15, after start of
delivery.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 11,0 v2
 Edition : 07.09.89
 Replaces : 24.7.87
 Test oil : ISO-4113
 Combination no. : 0 402 646 804
 Injection pump
 Pump designation : PE6P120A720RS7004
 EP type number : 0 412 626 801
 Governor
 Governor design. : RQ900PA528
 Governor no. : 0 421 801 127

Customer-spec. information
 Customer : SAAB - SCANIA

Engine : DS11 43,44,45

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10
 : (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.80...12.90

Del.quantity cm³/ : 20.7...20.9

100 s: (20.4...21.2)

Spread cm³ : 0.6

100 s: (0.9)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Del.quantity : 207.0...209.0

1000 : (204.0...212.0)

Spread cm³ : 6.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 22...30

Testing:

1st rack travel in: 11.80

Speed rpm : 900...905

2nd rack travel in: 4.00

Speed rpm : 941...955

4th rack travel in: 1000

Speed rpm : 0.00...1.00

LOW IDLE 1

Testing:

Speed rpm : 100

Rack travel in mm : 2.00

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 240.0...290.0
1000 s: (-)
Rack travel in mm : 20.00...21.00

HIGH IDLE

1st version
Rack travel in mm : 4.90...5.10
Spread cm³ : 4.00
1000 s: (7.00)

Remarks:

:

Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

ADDITIONAL INFORMATION

Check and set without ROBO diaphragm

For comb. with letter index see
VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over
on Oct. 17, 1988

Engine model DS 11 - 17, before top
dead center.

Engine model DSI 11 - 16, before top
dead center.

Firing sequence of engine:
1-5-3-6-2-4.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 14,0 h2
 Edition : 07.02.89
 Replaces : 29.1.88
 Test oil : ISO-4113
 Combination no. : 0 402 648 839
 Injection pump
 Pump designation : PE8P120A920/4LS7125T
 EP type number : 0 412 628 824
 Governor
 Governor design. : RQV200...950PA736-1
 Governor no. : 0 421 813 551

Customer-spec. information
 Customer : SAAB-SCANIA

Engine : DSC14 03

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10
 : (4.95...5.15)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 7- 3- 4- 5-
 6- 8

Phasing : 0-45-90-135-180-225-
 270-315

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.80...13.90

Del.quantity cm3/ : 22.1...22.3

100 s: (21.8...22.6)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 4.9...5.3

Del.quantity cm3/ : 1.6...2.0

100 s: (-)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225
 travel mm : 1.20...1.60

2nd speed rpm : 350
 travel mm : 2.30...2.90

3rd speed rpm : 650
 travel mm : 4.40...5.00

4th speed rpm : 995
 travel mm : 7.70...7.90

5th speed rpm : 1125
 travel mm : 9.30...9.70

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1040

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 221.0...223.0

1000 : (218.0...226.0)

Spread cm³ : 6.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 56...64

Testing:
1st rack travel in: 12.80
Speed rpm : 990...1000
2nd rack travel in: 4.00
Speed rpm : 1110...1140
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 6...14

Testing:
Speed rpm : 100
Minimum rack travel: 6.50
Speed rpm : 225
Rack travel in mm : 4.90...5.10
Rack travel in mm : 2.00
Speed rpm : 360...420

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 13.80...13.90

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 11.20...11.60
2nd pressure hPa : 365
Rack travel in m: 12.80...12.90
3rd pressure hPa : 215
Rack travel in m: 11.90...12.10

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 950
Del.quantity cm³/ : 211.0...219.0
1000 s: (209.0...221.0)
Aneroid pressure h: -
Speed rpm : 500

Del.quantity cm³/ : 158.0...162.0
1000 s: (156.0...164.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 12.80
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 240.0...290.0
1000 s: (-)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 225
Rack travel in mm : 4.90...5.10

Remarks:

Test specifications approved by Scania
on 1987-12-15

Because of flattening, set the spring
preload on new delivery-valve holders
to 2.9...3.1 mm.

ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO
diaphragm.

For comb. with Letter index see
VDT-I-400/116.

For sealing see VDT-I-400/117.

* Increase in control-rod travel with
respect to setting at least 0.1 mm

Start of delivery - engine: 16, before
TDC

Engine firing sequence: 1-5-4-2-6-3-7-8

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet :
Edition : 02.05.89
Replaces :
Test oil : ISO-4113

Injection pump
Pump designation : PE5P100A72ORS491
EP type number : 9 400 087 044
Governor
Governor design. : RQ300/1100PA269-1
Governor no. : 0 421 801 237

Customer-spec. information
Customer : M B B

Engine : OM 355-5

1st version kW : 150.0

TEST BENCH REQUIREMENTS

Test oil
inlet temp., C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60
: (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.70...12.80

Del.quantity cm3/ : 12.5...12.7

100 s: (12.3...12.9)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 8.1...8.3

Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.5)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
travel mm : 2.30...2.60

2nd speed rpm : 600
travel mm : 6.90...7.10

3rd speed rpm : 1150
travel mm : 7.30...7.70

4th speed rpm : 1200
travel mm : 10.00...10.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 13.40...13.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 125.0...127.0

1000 : (123.0...129.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600
Rack travel in mm : 13.6

Testing:

1st rack travel in: 11.70
Speed rpm : 1145...1160
2nd rack travel in: 4.00
Speed rpm : 1190...1220
4th rack travel in: 1350
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 8.1

Testing:

Speed rpm : 100
Minimum rack trave: 9.70
Speed rpm : 300
Rack travel in mm : 8.00...8.20
Rack travel in mm : 2.00
Speed rpm : 375...415

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600
Del.quantity cm3/ : 117.0...121.0
1000 s: (114.5...123.5)
Spread cm3 : 5.00
1000 s: (7.)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.70
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 150.0...170.0
1000 s: (146.0...174.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1a11
Edition : 31.10.89
Replaces : 30.5.89
Test oil : ISO-4113

Combination no. : 0 402 736 800

Injection pump
Pump designation : PES6P120A720/3RS7135
-1

EP type number : 0 412 726 818

Governor

Governor design. : RQV325...1050PA848-
20K

Governor no. : 0 421 815 203

Customer-spec. information

Customer : MACK

Engine : EM6 300 2VH

1st version kW : 224.0

Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00x2.00x600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

A23

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
: (2.70...2.90)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Phasing
Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.90...13.00

Del.quantity cm³/ : 19.9...20.1

100 s: (19.6...20.4)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.8...5.0

Del.quantity cm³/ : 3.8...4.4

100 s: (3.6...4.6)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.40...1.60

2nd speed rpm : 450

travel mm : 2.50...2.80

3rd speed rpm : 800

travel mm : 4.80...5.00

4th speed rpm : 1050

travel mm : 7.30...7.60

5th speed rpm : 1200

travel mm : 9.40...9.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1200

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050
Aneroid pressure h : 900
Del.quantity : 199.0...201.0
1000 : (196.0...204.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 56...64

Testing:
1st rack travel in: 11.90
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1170...1200
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 10...18

Testing:
Speed rpm : 275
Minimum rack trave: 6.30
Speed rpm : 325
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION
Speed rpm : 325...600

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 12.90...13.00
2nd speed rpm : 630
Rack travel in m: 13.00...13.10
3rd speed rpm : 500
Rack travel in m: 0.00...12.60

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 630
Pressure hPa : 900
Rack travel mm : 13.00...13.10

Measurement
Speed 1/min : 630

1st pressure hPa : -
Rack travel in m: 7.80...8.20
2nd pressure hPa : 190
Rack travel in m: 9.10...9.20

3rd pressure hPa : 410
Rack travel in m: 11.40...11.80

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 630
Del.quantity cm3/ : 213.0...219.0
1000 s: (210.0...222.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 121.0...125.0
1000 s: (119.0...127.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.90
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 110.0...150.0
1000 s: (100.0...160.0)
Rack travel in mm : 7.80...8.20

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.80...5.00
Del.quantity cm3/ : 38.0...44.0
1000 s: (36.0...46.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension
3.0...3.2 mm.

APPLICATION

Omnibus

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a
 Edition : 30.10.89
 Replaces : 7.2.89
 Test oil : ISO-4113

Combination no. : 0 402 746 810

Injection pump
 Pump designation : PES6P120A720RS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...900PA848K
 Governor no. : 0 421 815 168

Customer-spec. information
 Customer : MACK

Engine : E6-350 4VH

1st version kW : 261.0
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.90...14.00

Del.quantity cm³/ : 23.6...23.8

100 s: (23.3...24.1)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.0...4.2

Del.quantity cm³/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 3.10...3.30

3rd speed rpm : 850

travel mm : 5.90...6.10

4th speed rpm : 1000

travel mm : 7.50...7.70

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 900

Del.quantity : 236.5...238.5

1000 : (233.5...241.5)

Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 53...61

Testing:
1st rack travel in: 12.90
Speed rpm : 950...960
2nd rack travel in: 4.00
Speed rpm : 1075...1105
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 7...15

Testing:
Speed rpm : 275
Minimum rack travel: 5.50
Speed rpm : 325
Rack travel in mm : 4.00...4.20

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 900
Rack travel in m: 13.90...14.00
2nd speed rpm : 625
Rack travel in m: 14.10...14.20
3rd speed rpm : 800
Rack travel in m: 14.00...14.10
4th speed rpm : 500
Rack travel in m: 0.00...13.50

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 625
Pressure hPa : 900
Rack travel mm : 14.10...14.20

Measurement
Speed 1/min : 625

1st pressure hPa : -
Rack travel in m: 8.50...8.90
2nd pressure hPa : 275
Rack travel in m: 10.00...10.10
3rd pressure hPa : 570

Rack travel in m: 12.30...12.70

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 625
Del.quantity cm³/ : 257.0...263.0
1000 s: (254.0...266.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 142.0...146.0
1000 s: (140.0...148.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.90
Speed rpm : 950...960

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 8.50...8.90

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.00...4.20
Del.quantity cm³/ : 32.0...38.0
1000 s: (30.0...40.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a1
 Edition : 31.10.89
 Replaces : 7.2.89
 Test oil : ISO-4113
 Combination no. : 0 402 746 814
 Injection pump
 Pump designation : PES6P120A720RS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...850PA848-1K
 Governor no. : 0 421 815 169

Customer-spec. information
 Customer : MACK

Engine : E6-300 4VH

1st version kW : 224.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.90...13.00

Del.quantity cm3/ : 20.0...20.2

100 s: (19.7...20.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0
 Rack travel in mm : 4.5...4.7
 Del.quantity cm3/ : 3.2...3.8
 100 s: (3.0...4.0)
 Spread cm3 : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40
 2nd speed rpm : 450
 travel mm : 2.80...3.10
 3rd speed rpm : 850
 travel mm : 6.20...6.40
 4th speed rpm : 1000
 travel mm : 7.70...7.90

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1100
 Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 850
 Aneroid pressure h: 900
 Del.quantity : 200.5...202.5
 1000 : (197.5...205.5)

Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 52...60

Testing:

1st rack travel in: 11.90
Speed rpm : 900...910
2nd rack travel in: 4.00
Speed rpm : 1025...1055
4th rack travel in: 1100
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 7...15

Testing:

Speed rpm : 275
Minimum rack travel: 6.00
Speed rpm : 325
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 850
Rack travel in m: 12.90...13.00
2nd speed rpm : 700
Rack travel in m: 13.30...13.50
3rd speed rpm : 600
Rack travel in m: 13.50...13.70
4th speed rpm : 500
Rack travel in m: 0.00...13.10

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 13.50...13.70

Measurement

Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 9.90...10.30
2nd pressure hPa : 250
Rack travel in m: 10.90...11.00
3rd pressure hPa : 475

Rack travel in m: 12.60...13.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 700
Del.quantity cm3/ : 217.0...223.0
1000 s: (214.0...226.0)
Aneroid pressure h: 900
Speed rpm : 600
Del.quantity cm3/ : 233.0...239.0
1000 s: (230.0...242.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 154.0...158.0
1000 s: (152.0...160.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.90
Speed rpm : 900...910

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 195.0...235.0
1000 s: (185.0...245.0)
Rack travel in mm : 9.90...10.30

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm3/ : 32.0...38.0
1000 s: (30.0...40.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a2
 Edition : 31.10.89
 Replaces : 7.2.89
 Test oil : ISO-4113
 Combination no. : 0 402 746 815
 Injection pump
 Pump designation : PES6P120A72ORS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...850PA848-2K
 Governor no. : 0 421 815 170

Customer-spec. information
 Customer : MACK

Engine : E6-275 4VH

1st version kW : 202.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.00...12.10

Del.quantity cm3/ : 18.1...18.3

100 s: (17.8...18.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0
 Rack travel in mm : 4.5...4.7
 Del.quantity cm3/ : 3.2...3.8
 100 s: (3.0...4.0)

Spread cm3 : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40
 2nd speed rpm : 450
 travel mm : 2.80...3.10
 3rd speed rpm : 850
 travel mm : 6.20...6.40
 4th speed rpm : 1000
 travel mm : 7.70...7.90

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1110
 Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 850
 Aneroid pressure h: 900
 Del.quantity : 181.0...183.0
 1000 : (178.0...186.0)

Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 52...60

Testing:
1st rack travel in: 11.00
Speed rpm : 900...910
2nd rack travel in: 4.00
Speed rpm : 1025...1055
4th rack travel in: 1150
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 7...15

Testing:
Speed rpm : 275
Minimum rack travel: 6.00
Speed rpm : 325
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 850
Rack travel in m: 12.00...12.10
2nd speed rpm : 600
Rack travel in m: 12.60...12.70
3rd speed rpm : 700
Rack travel in m: 12.50...12.70
4th speed rpm : 500
Rack travel in m: 0.00...12.40

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 12.60...12.70

Measurement
Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 9.50...9.90
2nd pressure hPa : 215
Rack travel in m: 10.30...10.40
3rd pressure hPa : 360

Rack travel in m: 11.50...11.90

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 600
Del.quantity cm³/ : 210.5...216.5
1000 s: (207.5...219.5)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 144.0...148.0
1000 s: (142.0...150.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.00
Speed rpm : 900...910

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 160.0...200.0
1000 s: (150.0...210.0)
Rack travel in mm : 9.50...9.90

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm³/ : 32.0...38.0
1000 s: (30.0...40.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a3
 Edition : 31.10.89
 Replaces : 7.2.89
 Test oil : ISO-4113

Combination no. : 0 402 746 816

Injection pump
 Pump designation : PES6P120A720RS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...875PA848-3K
 Governor no. : 0 421 815 171

Customer-spec. information
 Customer : MACK

Engine : EM6-250L 4VH

1st version kW : 186.0
 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 10.80...10.90

Del.quantity cm3/ : 16.3...16.5

100 s: (16.0...16.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm3/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 850

travel mm : 6.20...6.40

4th speed rpm : 1000

travel mm : 7.70...7.90

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 163.0...165.0

1000 : (160.0...168.0)

Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 52...60

Testing:
1st rack travel in: 9.80
Speed rpm : 925...935
2nd rack travel in: 4.00
Speed rpm : 1010...1040
4th rack travel in: 1100
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 9...17

Testing:
Speed rpm : 275
Minimum rack travel: 6.00
Speed rpm : 325
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 10.80...10.90
2nd speed rpm : 510
Rack travel in m: 13.00...13.20
3rd speed rpm : 700
Rack travel in m: 11.60...11.80
4th speed rpm : 550
Rack travel in m: 0.00...13.10

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel mm : 13.00...13.20

Measurement
Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 8.60...9.00
2nd pressure hPa : 215
Rack travel in m: 10.30...10.40
3rd pressure hPa : 435

Rack travel in m: 12.20...12.60

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm³/ : 240.0...246.0
1000 s: (237.0...249.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 146.0...150.0
1000 s: (144.0...152.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 9.80
Speed rpm : 925...935

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 145.0...185.0
1000 s: (135.0...195.0)
Rack travel in mm : 8.60...9.00

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm³/ : 39.0...45.0
1000 s: (37.0...47.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a4
 Edition : 31.10.89
 Replaces : 29.3.89
 Test oil : ISO-4113

Combination no. : 0 402 746 817

Injection pump
 Pump designation : PES6P120A72ORS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...900PA848-4K
 Governor no. : 0 421 815 173

Customer spec. information
 Customer : MACK

Engine : EC6-350 4VH

1st version kW : 261.0
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 15.20...15.30

Del.quantity cm³/ : 25.0...25.2

100 s: (24.7...25.5)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.9...5.1

Del.quantity cm³/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40

2nd speed rpm : 450
 travel mm : 3.10...3.30

3rd speed rpm : 850
 travel mm : 5.90...6.10

4th speed rpm : 1000
 travel mm : 7.50...7.70

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1200

Del.quantity : 250.5...252.5

1000 : (247.5...255.5)

Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control Lever
position degrees: 56...64

Testing:

1st rack travel in: 14.20
Speed rpm : 950...960
2nd rack travel in: 4.00
Speed rpm : 1090...1120
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever
position degrees: 7...15

Testing:

Speed rpm : 275
Minimum rack travel: 6.40
Speed rpm : 325
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 900
Rack travel in m: 15.20...15.30
2nd speed rpm : 625
Rack travel in m: 15.50...15.60
3rd speed rpm : 700
Rack travel in m: 15.40...15.60
4th speed rpm : 500
Rack travel in m: <15.00

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 625
Pressure hPa : 1200
Rack travel mm : 15.50...15.60

Measurement

Speed 1/min : 625

1st pressure hPa : -
Rack travel in m: 8.30...8.70
2nd pressure hPa : 280
Rack travel in m: 10.40...10.50
3rd pressure hPa : 650
Rack travel in m: 13.30...13.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 625
Del.quantity cm³/ : 278.0...284.0
1000 s: (275.0...287.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 130.5...134.5
1000 s: (128.5...136.5)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 14.20
Speed rpm : 950...960

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 120.0...160.0
1000 s: (110.0...170.0)
Rack travel in mm : 8.30...8.70

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.90...5.10
Del.quantity cm³/ : 39.0...45.0
1000 s: (37.0...47.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a5
 Edition : 31.10.89
 Replaces : 7.2.89
 Test oil : ISO-4113
 Combination no. : 0 402 746 818
 Injection pump
 Pump designation : PES6P120A72ORS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...875PA848-5K
 Governor no. : 0 421 815 174

Customer spec. information
 Customer : MACK

Engine : EM6-275L 4VH

1st version kW : 202.0
 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 12.20...12.30

Del.quantity cm3/ : 19.0...19.2

100 s: (18.7...19.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.6...4.8

Del.quantity cm3/ : 3.7...4.3
 100 s: (3.5...4.5)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40

2nd speed rpm : 450
 travel mm : 2.80...3.10

3rd speed rpm : 850
 travel mm : 6.20...6.40

4th speed rpm : 1000
 travel mm : 7.70...7.90

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1

Speed rpm : 1110

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 190.0...192.0

1000 : (187.0...195.0)

Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 52...60

Testing:
1st rack travel in: 11.20
Speed rpm : 925...935
2nd rack travel in: 4.00
Speed rpm : 1030...1060
4th rack travel in: 1150
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 9...17

Testing:
Speed rpm : 275
Minimum rack travel: 6.10
Speed rpm : 325
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 12.20...12.30
2nd speed rpm : 510
Rack travel in m: 14.10...14.30
3rd speed rpm : 700
Rack travel in m: 13.20...13.40
4th speed rpm : 400
Rack travel in m: 0.00...13.80

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel mm : 14.10...14.30

Measurement
Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 9.40...9.60
2nd pressure hPa : 280
Rack travel in m: 10.60...10.70
3rd pressure hPa : 485

Rack travel in m: 12.70...13.30

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm³/ : 262.5...268.5
1000 s: (259.5...271.5)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 145.0...149.0
1000 s: (143.0...151.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.20
Speed rpm : 925...935

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 9.40...9.60

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.60...4.80
Del.quantity cm³/ : 37.0...43.0
1000 s: (35.0...45.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a6
 Edition : 31.10.89
 Replaces : 7.2.89
 Test oil : ISO-4113

Combination no. : 0 402 746 819

Injection pump
 Pump designation : PES6P120A72ORS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...875PA848-6K
 Governor no. : 0 421 815 175

Customer-spec. information
 Customer : MACK

Engine : EM6-225L 4VH

1st version kW : 165.0
 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 11.00...11.10

Del.quantity cm3/ : 15.8...16.0

100 s: (15.5...16.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.6...4.8

Del.quantity cm3/ : 3.8...4.4

100 s: (3.6...4.6)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.10

3rd speed rpm : 850

travel mm : 6.20...6.40

4th speed rpm : 1000

travel mm : 7.70...7.90

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1110

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 900

Del.quantity : 158.5...160.5

1000 : (155.5...163.5)

Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 52...60

Testing:
1st rack travel in: 10.00
Speed rpm : 925...935
2nd rack travel in: 4.00
Speed rpm : 1015...1045
4th rack travel in: 1150
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 9...17

Testing:
Speed rpm : 275
Minimum rack travel: 6.10
Speed rpm : 325
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 11.00...11.10
2nd speed rpm : 510
Rack travel in m: 13.20...13.40
3rd speed rpm : 600
Rack travel in m: 12.50...12.70
4th speed rpm : 700
Rack travel in m: 11.80...12.00
5th speed rpm : 350
Rack travel in m: 0.00...13.20

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 510
Pressure hPa : 900
Rack travel mm : 13.20...13.40

Measurement
Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 8.50...8.90
2nd pressure hPa : 220

Rack travel in m: 9.70...9.80
3rd pressure hPa : 500
Rack travel in m: 12.00...12.40

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 510
Del.quantity cm3/ : 234.0...240.0
1000 s: (231.0...243.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 131.0...135.0
1000 s: (129.0...137.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack travel: 10.00
Speed rpm : 925...935

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 135.0...175.0
1000 s: (125.0...185.0)
Rack travel in mm : 8.50...8.90

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.60...4.80
Del.quantity cm3/ : 38.0...44.0
1000 s: (36.0...46.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 b5
 Edition : 31.10.89
 Replaces : 7.2.89
 Test oil : ISO-4113
 Combination no. : 0 402 746 820
 Injection pump
 Pump designation : PES6P120A720RS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...850PA878K
 Governor no. : 0 421 815 177

Customer-spec. information
 Customer : MACK

Engine : E6-275 4VH

1st version kW : 202.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.00...12.10

Del.quantity cm³/ : 18.1...18.3

100 s: (17.8...18.6)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 325.0
 Rack travel in mm : 4.5...4.7
 Del.quantity cm³/ : 3.2...3.8
 100 s: (3.0...4.0)
 Spread cm³ : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40
 2nd speed rpm : 450
 travel mm : 2.80...3.10
 3rd speed rpm : 850
 travel mm : 6.20...6.40
 4th speed rpm : 1000
 travel mm : 7.70...7.90

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1110
 Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 850
 Aneroid pressure h: 900
 Del.quantity : 181.0...183.0
 1000 : (178.0...186.0)

Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 52...60

Testing:
1st rack travel in: 11.00
Speed rpm : 900...910
2nd rack travel in: 4.00
Speed rpm : 1025...1055
4th rack travel in: 1150
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 7...15

Testing:
Speed rpm : 275
Minimum rack travel: 6.00
Speed rpm : 325
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 850
Rack travel in m: 12.00...12.10
2nd speed rpm : 600
Rack travel in m: 12.60...12.70
3rd speed rpm : 700
Rack travel in m: 12.50...12.70
4th speed rpm : 500
Rack travel in m: 0.00...12.40

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 12.60...12.70

Measurement
Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 9.50...9.90
2nd pressure hPa : 215
Rack travel in m: 10.30...10.40
3rd pressure hPa : 360

Rack travel in m: 11.50...11.90

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 600
Del.quantity cm3/ : 210.5...216.5
1000 s: (207.5...219.5)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 144.0...148.0
1000 s: (142.0...150.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.00
Speed rpm : 900...910

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 160.0...200.0
1000 s: (150.0...210.0)
Rack travel in mm : 9.50...9.90

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm3/ : 32.0...38.0
1000 s: (30.0...40.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 b
 Edition : 31.10.89
 Replaces : 7.2.89
 Test oil : ISO-4113
 Combination no. : 0 402 746 821
 Injection pump
 Pump designation : PES6P120A72ORS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...850PA878-1K
 Governor no. : 0 421 815 178

Customer-spec. information
 Customer : MACK

Engine : E6-300 4VH

1st version kW : 224.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., C : 38...42

Overflow valve
 : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.90...13.00

Del.quantity cm3/ : 20.0...20.2

100 s: (19.7...20.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0
 Rack travel in mm : 4.5...4.7
 Del.quantity cm3/ : 3.2...3.8
 100 s: (3.0...4.0)
 Spread cm3 : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40
 2nd speed rpm : 450
 travel mm : 2.80...3.10
 3rd speed rpm : 850
 travel mm : 6.20...6.40
 4th speed rpm : 1000
 travel mm : 7.70...7.90

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1100
 Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 850
 Aneroid pressure h: 900
 Del.quantity : 200.5...202.5
 1000 : (197.5...205.5)

Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 52...60

Testing:
1st rack travel in: 11.90
Speed rpm : 900...910
2nd rack travel in: 4.00
Speed rpm : 1025...1055
4th rack travel in: 1100
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 7...15

Testing:
Speed rpm : 275
Minimum rack travel: 6.00
Speed rpm : 325
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 850
Rack travel in m: 12.90...13.00
2nd speed rpm : 700
Rack travel in m: 13.30...13.50
3rd speed rpm : 600
Rack travel in m: 13.50...13.70
4th speed rpm : 500
Rack travel in m: 0.00...13.10

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 13.50...13.70

Measurement
Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 9.90...10.30
2nd pressure hPa : 250
Rack travel in m: 10.90...11.00
3rd pressure hPa : 475

Rack travel in m: 12.60...13.00

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 700
Del.quantity cm³/ : 217.0...223.0
1000 s: (214.0...226.0)
Aneroid pressure h: 900
Speed rpm : 600
Del.quantity cm³/ : 233.0...239.0
1000 s: (230.0...242.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 154.0...158.0
1000 s: (152.0...160.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.90
Speed rpm : 900...910

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 195.0...235.0
1000 s: (185.0...245.0)
Rack travel in mm : 9.90...10.30

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm³/ : 32.0...38.0
1000 s: (30.0...40.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 b1
Edition : 31.10.89
Replaces : 7.2.89
Test oil : ISO-4113

Combination no. : 0 402 746 822

Injection pump
Pump designation : PES6P120A720RS7135
EP type number : 0 412 726 807
Governor
Governor design. : RQV325...900PA878-2K
Governor no. : 0 421 815 179

Customer-spec. information
Customer : MACK

Engine : E6-350 4VH

1st version kW : 261.0
Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
: (2.70...2.90)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 23.6...23.8

100 s: (23.3...24.1)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0
Rack travel in mm : 4.0...4.2
Del.quantity cm3/ : 3.2...3.8
100 s: (3.0...4.0)
Spread cm3 : 0.8
100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
travel mm : 1.20...1.40
2nd speed rpm : 450
travel mm : 3.10...3.30
3rd speed rpm : 850
travel mm : 5.90...6.10
4th speed rpm : 1000
travel mm : 7.50...7.70

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1130
Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 900
Aneroid pressure h: 900
Del.quantity : 236.5...238.5
1000 : (233.5...241.5)

Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 55...63

Testing:
1st rack travel in: 12.90
Speed rpm : 950...960
2nd rack travel in: 4.00
Speed rpm : 1075...1105
4th rack travel in: 1150
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 7...15

Testing:
Speed rpm : 275
Minimum rack travel: 5.50
Speed rpm : 325
Rack travel in mm : 4.00...4.20

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 900
Rack travel in m: 13.90...14.00
2nd speed rpm : 625
Rack travel in m: 14.10...14.20
3rd speed rpm : 800
Rack travel in m: 14.00...14.10
4th speed rpm : 500
Rack travel in m: 0.00...13.50

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 625
Pressure hPa : 900
Rack travel mm : 14.10...14.20

Measurement
Speed 1/min : 625

1st pressure hPa : -
Rack travel in m: 8.50...8.90
2nd pressure hPa : 275
Rack travel in m: 10.00...10.10
3rd pressure hPa : 570

Rack travel in m: 12.30...12.70

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 625
Del.quantity cm³/ : 257.0...263.0
1000 s: (254.0...266.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 142.0...146.0
1000 s: (140.0...148.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.90
Speed rpm : 950...960

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 8.50...8.90

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.00...4.20
Del.quantity cm³/ : 32.0...38.0
1000 s: (30.0...40.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 b2
 Edition : 31.10.89
 Replaces : 7.2.89
 Test oil : ISO-4113
 Combination no. : 0 402 746 823
 Injection pump
 Pump designation : PES6P120A72ORS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...875PA878-3K
 Governor no. : 0 421 815 180

Customer-spec. information
 Customer : MACK

Engine : EM6-275L 4VH

1st version kW : 202.0
 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 12.20...12.30

Del.quantity cm3/ : 19.0...19.2

100 s : (18.7...19.5)

Spread cm3 : 0.5

100 s : (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.6...4.8

Del.quantity cm3/ : 3.7...4.3

100 s : (3.5...4.5)

Spread cm3 : 0.8

100 s : (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40

2nd speed rpm : 450
 travel mm : 2.80...3.10

3rd speed rpm : 850
 travel mm : 6.20...6.40

4th speed rpm : 1000
 travel mm : 7.70...7.90

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1110

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 190.0...192.0

1000 : (187.0...195.0)

Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 52...60

Testing:

1st rack travel in: 11.20
Speed rpm : 925...935
2nd rack travel in: 4.00
Speed rpm : 1030...1060
4th rack travel in: 1150
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 9...17

Testing:

Speed rpm : 275
Minimum rack travel: 1.50
Speed rpm : 325
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 12.20...12.30
2nd speed rpm : 510
Rack travel in m: 14.10...14.30
3rd speed rpm : 700
Rack travel in m: 13.20...13.40
4th speed rpm : 400
Rack travel in m: 0.00...13.80

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel mm : 14.10...14.30

Measurement

Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 9.40...9.60
2nd pressure hPa : 280
Rack travel in m: 10.60...10.70
3rd pressure hPa : 485

Rack travel in m: 12.70...13.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm³/ : 262.5...268.5
1000 s: (259.5...271.5)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 145.0...149.0
1000 s: (143.0...151.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.20
Speed rpm : 925...935

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 9.40...9.60

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.60...4.80
Del.quantity cm³/ : 37.0...43.0
1000 s: (35.0...45.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 b3
 Edition : 31.10.89
 Replaces : 7.2.89
 Test oil : ISO-4113

Combination no. : 0 402 746 824

Injection pump
 Pump designation : PES6P120A720RS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...875PA878-4K
 Governor no. : 0 421 815 181

Customer-spec. information
 Customer : MACK

Engine : EM6-225L 4VH

1st version kW : 165.0
 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 11.00...11.10

Del.quantity cm3/ : 15.8...16.0

100 s: (15.5...16.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.6...4.8

Del.quantity cm3/ : 3.8...4.4

100 s: (3.6...4.6)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.10

3rd speed rpm : 850

travel mm : 6.20...6.40

4th speed rpm : 1000

travel mm : 7.70...7.90

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1110

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 900

Del.quantity : 158.5...160.5

1000 : (155.5...163.5)

Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 52...60

Testing:
1st rack travel in: 10.00
Speed rpm : 925...935
2nd rack travel in: 4.00
Speed rpm : 1015...1045
4th rack travel in: 1150
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 9...17

Testing:
Speed rpm : 275
Minimum rack travel: 6.10
Speed rpm : 325
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 11.00...11.10
2nd speed rpm : 510
Rack travel in m: 13.20...13.40
3rd speed rpm : 600
Rack travel in m: 12.50...12.70
4th speed rpm : 700
Rack travel in m: 11.80...12.00
5th speed rpm : 350
Rack travel in m: 0.00...13.20

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 510
Pressure hPa : 900
Rack travel mm : 13.20...13.40

Measurement
Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 8.50...8.90
2nd pressure hPa : 220

B20

Rack travel in m: 9.70...9.80
3rd pressure hPa : 500
Rack travel in m: 12.00...12.40

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 510
Del.quantity cm³/ : 234.0...240.0
1000 s: (231.0...243.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 131.0...135.0
1000 s: (129.0...137.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.00
Speed rpm : 925...935

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...175.0
1000 s: (125.0...185.0)
Rack travel in mm : 8.50...8.90

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.60...4.80
Del.quantity cm³/ : 38.0...44.0
1000 s: (36.0...46.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 b6
 Edition : 31.10.89
 Replaces : 29.3.89
 Test oil : ISO-4113

Combination no. : 0 402 746 825

Injection pump
 Pump designation : PES6P120A72ORS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...900PA878-5K
 Governor no. : 0 421 815 182

Customer-spec. information
 Customer : MACK

Engine : EC6-350 4VH

1st version kW : 261.0
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 15.20...15.30

Del.quantity cm³/ : 25.0...25.2

100 s: (24.7...25.5)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.9...5.1

Del.quantity cm³/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 3.10...3.30

3rd speed rpm : 850

travel mm : 5.90...6.10

4th speed rpm : 1000

travel mm : 7.50...7.70

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1200

Del.quantity : 250.5...252.5

1000 : (247.5...255.5)

Spread cm3 : 5.00
 1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 56...64

Testing:
1st rack travel in: 14.20
Speed rpm : 950...960
2nd rack travel in: 4.00
Speed rpm : 1090...1120
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 7...15

Testing:
Speed rpm : 275
Minimum rack travel: 6.40
Speed rpm : 325
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 900
Rack travel in m: 15.20...15.30
2nd speed rpm : 625
Rack travel in m: 15.50...15.60
3rd speed rpm : 700
Rack travel in m: 15.40...15.60
4th speed rpm : 500
Rack travel in m: <15.00

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 625
Pressure hPa : 1200
Rack travel mm : 15.50...15.60

Measurement

Speed 1/min : 625

1st pressure hPa : -
Rack travel in m: 8.30...8.70
2nd pressure hPa : 280
Rack travel in m: 10.40...10.50
3rd pressure hPa : 650
Rack travel in m: 13.30...13.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 625
Del.quantity cm3/ : 278.0...284.0
 1000 s: (275.0...287.0)
Spread cm3 : 8.00
 1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 130.5...134.5
 1000 s: (128.5...136.5)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 14.20
Speed rpm : 950...960

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 120.0...160.0
 1000 s: (110.0...170.0)
Rack travel in mm : 8.30...8.70

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.90...5.10
Del.quantity cm3/ : 39.0...45.0
 1000 s: (37.0...47.0)
Spread cm3 : 8.00
 1000 s: (12.00)

Remarks:

:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 b4
 Edition : 31.10.89
 Replaces : 7.2.89
 Test oil : ISO-4113
 Combination no. : 0 402 746 826
 Injection pump
 Pump designation : PES6P120A720RS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...875PA878-6K
 Governor no. : 0 421 815 183

Customer-spec. information
 Customer : MACK

Engine : EM6-250L 4VH

1st version kW : 186.0
 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 10.80...10.90

Del. quantity cm³/ : 16.3...16.5

100 s: (16.0...16.8)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del. quantity cm³/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40

2nd speed rpm : 450
 travel mm : 2.80...3.20

3rd speed rpm : 850
 travel mm : 6.20...6.40

4th speed rpm : 1000
 travel mm : 7.70...7.90

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del. quantity : 163.0...165.0

1000 : (160.0...168.0)

Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version

Control lever
position degrees: 52...60

Testing:

1st rack travel in: 9.80
Speed rpm : 925...935
2nd rack travel in: 4.00
Speed rpm : 1010...1040
4th rack travel in: 1100
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 9...17

Testing:

Speed rpm : 275
Minimum rack travel: 6.00
Speed rpm : 325
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 10.80...10.90
2nd speed rpm : 510
Rack travel in m: 13.00...13.20
3rd speed rpm : 700
Rack travel in m: 11.60...11.80
4th speed rpm : 550
Rack travel in m: 0.00...13.10

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel mm : 13.00...13.20

Measurement

Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 8.60...9.00
2nd pressure hPa : 215
Rack travel in m: 10.30...10.40
3rd pressure hPa : 435

Rack travel in m: 12.20...12.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm³/ : 240.0...246.0
1000 s: (237.0...249.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 146.0...150.0
1000 s: (144.0...152.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.80
Speed rpm : 925...935

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 145.0...185.0
1000 s: (135.0...195.0)
Rack travel in mm : 8.60...9.00

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm³/ : 39.0...45.0
1000 s: (37.0...47.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 c
 Edition : 31.10.89
 Replaces : 7.2.89
 Test oil : ISO-4113
 Combination no. : 0 402 746 827
 Injection pump
 Pump designation : PES6P120A720RS7148
 EP type number : 0 412 726 810
 Governor
 Governor design. : RQV325...875PA848-7K
 Governor no. : 0 421 815 176

Customer-spec. information
 Customer : MACK

Engine : EM6 300L 4VH

1st version kW : 224.0
 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve
 : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 6.00...8.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 11.10...11.20

Del.quantity cm³/ : 19.9...20.1

100 s: (19.6...20.4)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 325.0
 Rack travel in mm : 4.5...4.7
 Del.quantity cm³/ : 3.9...4.5
 100 s: (3.7...4.7)

Spread cm³ : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40

2nd speed rpm : 450
 travel mm : 2.50...2.80

3rd speed rpm : 600
 travel mm : 4.10...4.30

4th speed rpm : 875
 travel mm : 7.30...7.50

5th speed rpm : 1000
 travel mm : 8.70...9.00

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1

Speed rpm : 1040

Rack travel in mm : 6.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1500

Del.quantity : 199.0...201.0
1000 : (196.0...204.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 55...63

Testing:

1st rack travel in: 10.10
Speed rpm : 915...925
2nd rack travel in: 4.00
Speed rpm : 1000...1030
4th rack travel in: 1150
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 7...15

Testing:

Speed rpm : 275
Minimum rack travel: 6.00
Speed rpm : 325
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 11.10...11.20
2nd speed rpm : 510
Rack travel in m: 16.50...16.70
3rd speed rpm : 700
Rack travel in m: 13.30...13.50
4th speed rpm : 600
Rack travel in m: 15.50...15.70
5th speed rpm : 450
Rack travel in m: 0.00...16.60

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 510
Pressure hPa : 1500
Rack travel mm : 16.50...16.70

Measurement

Speed 1/min : 510

1st pressure hPa : -

Rack travel in m: 8.30...8.70
2nd pressure hPa : 370
Rack travel in m: 10.70...10.80
3rd pressure hPa : 710
Rack travel in m: 14.40...14.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500
Speed rpm : 510
Del.quantity cm³/ : 299.0...305.0
1000 s: (296.0...308.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 152.5...156.5
1000 s: (150.5...158.5)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 10.10
Speed rpm : 915...925

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 140.0...160.0
1000 s: (135.0...165.0)
Rack travel in mm : 8.30...8.70

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm³/ : 39.0...45.0
1000 s: (37.0...47.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 d
 Edition : 31.10.89
 Replaces : 7.2.89
 Test oil : ISO-4113
 Combination no. : 0 402 746 828
 Injection pump
 Pump designation : PES6P120A720RS7148
 EP type number : 0 412 726 810
 Governor
 Governor design. : RQV325...875PA878-7K
 Governor no. : 0 421 815 184

Customer-spec. information
 Customer : MACK

Engine : EM6 300L 4VH

1st version kW : 224.0
 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 6.00...8.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 11.10...11.20

Del.quantity cm3/ : 19.9...20.1

100 s: (19.6...20.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0
 Rack travel in mm : 4.5...4.7
 Del.quantity cm3/ : 3.9...4.5
 100 s: (3.7...4.7)

Spread cm3 : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40
 2nd speed rpm : 450
 travel mm : 2.50...2.80
 3rd speed rpm : 600
 travel mm : 4.10...4.30
 4th speed rpm : 875
 travel mm : 7.30...7.50
 5th speed rpm : 1000
 travel mm : 8.70...9.00

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1040
 Rack travel in mm : 6.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 875
 Aneroid pressure h: 1500

Del.quantity : 199.0...201.0
1000 : (196.0...204.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 55...63

Testing:
1st rack travel in: 10.10
Speed rpm : 915...925
2nd rack travel in: 4.00
Speed rpm : 1000...1030
4th rack travel in: 1150
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 7...15

Testing:
Speed rpm : 275
Minimum rack travel: 6.00
Speed rpm : 325
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 11.10...11.20
2nd speed rpm : 510
Rack travel in m: 16.50...16.70
3rd speed rpm : 700
Rack travel in m: 13.30...13.50
4th speed rpm : 600
Rack travel in m: 15.50...15.70
5th speed rpm : 450
Rack travel in m: 0.00...16.60

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 510
Pressure hPa : 1500
Rack travel mm : 16.50...16.70

Measurement
Speed 1/min : 510

1st pressure hPa : -

Rack travel in m: 8.30...8.70
2nd pressure hPa : 370
Rack travel in m: 10.70...10.80
3rd pressure hPa : 710
Rack travel in m: 14.40...14.80

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1500
Speed rpm : 510
Del.quantity cm3/ : 299.0...305.0
1000 s: (296.0...308.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 152.5...156.5
1000 s: (150.5...158.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.10
Speed rpm : 915...925

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 140.0...160.0
1000 s: (135.0...165.0)
Rack travel in mm : 8.30...8.70

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm3/ : 39.0...45.0
1000 s: (37.0...47.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a7
Edition : 30.10.89
Replaces : 7.2.89
Test oil : ISO-4113

Combination no. : 0 402 746 829

Injection pump
Pump designation : PES6P120A72ORS7135
EP type number : 0 412 726 807
Governor
Governor design. : RQV325...1050PA848-8
K
Governor no. : 0 421 815 185

Customer-spec. information
Customer : MACK

Engine : E6-270 4VH

1st version kW : 201.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
(2.70...2.90)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.20...12.30

Del.quantity cm³/ : 17.4...17.6

100 s: (17.1...17.9)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.9...5.1

Del.quantity cm³/ : 3.8...4.4
100 s: (3.6...4.6)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
travel mm : 1.40...1.60

2nd speed rpm : 450
travel mm : 2.50...2.80

3rd speed rpm : 800
travel mm : 4.80...5.00

4th speed rpm : 1050
travel mm : 7.30...7.60

5th speed rpm : 1200
travel mm : 9.40...9.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1210

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 900
Del.quantity : 174.0...176.0
1000 : (171.0...179.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 55...63

Testing:
1st rack travel in: 11.20
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1170...1200
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 10...18

Testing:
Speed rpm : 275
Minimum rack travel: 6.40
Speed rpm : 325
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 325...600

TORQUE CONTROL

Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 12.20...12.30
2nd speed rpm : 630
Rack travel in m: 12.00...12.20
3rd speed rpm : 925
Rack travel in m: 11.90...12.10
4th speed rpm : 800
Rack travel in m: 12.20...12.40

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 630
Pressure hPa : 900
Rack travel mm : 12.00...12.10

Measurement
Speed 1/min : 630

1st pressure hPa : -
Rack travel in m: 8.60...9.00

C02

2nd pressure hPa : 270
Rack travel in m: 9.60...9.70
3rd pressure hPa : 400
Rack travel in m: 11.00...11.50

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 630
Del.quantity cm3/ : 192.0...198.0
1000 s: (189.0...201.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 129.0...133.0
1000 s: (127.0...135.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.20
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 135.0...175.0
1000 s: (125.0...185.0)
Rack travel in mm : 8.60...9.00

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.90...5.10
Del.quantity cm3/ : 38.0...44.0
1000 s: (36.0...46.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1a10
 Edition : 30.10.89
 Replaces : 7.10.88
 Test oil : ISO-4113
 Combination no. : 0 402 746 831
 Injection pump
 Pump designation : PES6P120A720RS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...1050PA848-9
 K
 Governor no. : 0 421 815 187

Customer-spec. information
 Customer : MACK

Engine : EM6 300 2VH

1st version kW : 224.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., C : 38...42
 Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 9 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 10.30...10.70
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.90...13.00

Del.quantity cm3/ : 19.9...20.1

100 s: (19.6...20.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0
 Rack travel in mm : 4.8...5.0
 Del.quantity cm3/ : 3.8...4.4
 100 s: (3.6...4.6)
 Spread cm3 : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.40...1.60
 2nd speed rpm : 450
 travel mm : 2.50...2.80
 3rd speed rpm : 800
 travel mm : 4.80...5.00
 4th speed rpm : 1050
 travel mm : 7.30...7.60
 5th speed rpm : 1200
 travel mm : 9.40...9.60

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1200
 Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1050

Aneroid pressure h: 900
Del.quantity : 199.0...201.0
1000 : (196.0...204.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 56...64

Testing:
1st rack travel in: 11.90
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1170...1200
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 10...18

Testing:
Speed rpm : 275
Minimum rack trave: 6.30
Speed rpm : 325
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION
Speed rpm : 325...600

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 12.90...13.00
2nd speed rpm : 630
Rack travel in m: 13.00...13.10
3rd speed rpm : 500
Rack travel in m: 0.00...12.60

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 630
Pressure hPa : 900
Rack travel mm : 13.00...13.10

Measurement
Speed 1/min : 630

1st pressure hPa : -
Rack travel in m: 7.80...8.20
2nd pressure hPa : 190
Rack travel in m: 9.10...9.20
3rd pressure hPa : 410

C04

Rack travel in m: 11.40...11.80

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 630
Del.quantity cm³/ : 213.0...219.0
1000 s: (210.0...222.0)
Spread cm³ : 8.00
1000 s: (12.0)
Speed rpm : 400
Del.quantity cm³/ : 121.0...125.0
1000 s: (119.0...127.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.90
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 110.0...150.0
1000 s: (100.0...160.0)
Rack travel in mm : 7.80...8.20

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.80...5.00
Del.quantity cm³/ : 38.0...44.0
1000 s: (36.0...46.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

Because of flattening, set the spring preload on new delivery-valve holders to 3.0...3.1 mm.

APPLICATION

Omnibus

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a8
 Edition : 30.10.89
 Replaces : 10.2.88
 Test oil : ISO-4113
 Combination no. : 0 402 746 832
 Injection pump
 Pump designation : PES6P120A72ORS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...900PA848-10
 K
 Governor no. : 0 421 815 189

Customer-spec. information
 Customer : MACK

Engine : EM6 275 2VH

1st version kW : 202.0
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42
 Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 12.30...12.40

Del.quantity cm3/ : 18.7...18.9

100 s: (18.4...19.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0
 Rack travel in mm : 4.6...4.8
 Del.quantity cm3/ : 3.7...4.3
 100 s: (3.5...4.5)
 Spread cm3 : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40
 2nd speed rpm : 450
 travel mm : 3.10...3.30
 3rd speed rpm : 850
 travel mm : 5.90...6.10
 4th speed rpm : 1000
 travel mm : 7.50...7.70

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1120
 Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 900
 Aneroid pressure h: 900

Del.quantity : 187.0...189.0
1000 : (184.0...192.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 51...59

Testing:
1st rack travel in: 11.30
Speed rpm : 950...960
2nd rack travel in: 4.00
Speed rpm : 1055...1085
4th rack travel in: 1150
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 9...17

Testing:
Speed rpm : 275
Minimum rack travel: 6.10
Speed rpm : 325
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION
Speed rpm : 325...480

TORQUE CONTROL
Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 900
Rack travel in m: 12.30...12.40
2nd speed rpm : 540
Rack travel in m: 13.40...13.60
3rd speed rpm : 700
Rack travel in m: 12.70...12.90
4th speed rpm : 450
Rack travel in m: 0.00...13.50

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 540
Pressure hPa : 900
Rack travel mm : 13.40...13.60

Measurement
Speed 1/min : 540

1st pressure hPa : -
Rack travel in m: 9.00...9.40
2nd pressure hPa : 320

C06

Rack travel in m: 10.20...10.30
3rd pressure hPa : 550
Rack travel in m: 12.00...12.40

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 540
Del.quantity cm3/ : 239.0...247.0
1000 s: (237.0...249.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 142.0...146.0
1000 s: (140.0...148.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.30
Speed rpm : 950...960

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 150.0...190.0
1000 s: (140.0...200.0)
Rack travel in mm : 9.00...9.40

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.60...4.80
Del.quantity cm3/ : 37.0...43.0
1000 s: (35.0...45.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a9
 Edition : 30.10.89
 Replaces : 10.2.89
 Test oil : ISO-4113
 Combination no. : 0 402 746 833
 Injection pump
 Pump designation : PES6P120A720RS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...975PA848-11
 K
 Governor no. : 0 421 815 190

Customer-spec. information
 Customer : MACK

Engine : E6-350 2VH

1st version kW : 257.0
 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 975

Rack travel in mm : 14.10...14.20

Del.quantity cm3/ : 23.0...23.2

100 s: (22.7...23.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm3/ : 3.8...4.4

100 s: (3.6...4.6)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.40...1.60

2nd speed rpm : 450
 travel mm : 2.50...2.80

3rd speed rpm : 800
 travel mm : 4.80...5.00

4th speed rpm : 1050
 travel mm : 7.30...7.60

5th speed rpm : 1200
 travel mm : 9.40...9.60

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1

Speed rpm : 1190

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 975

Aneroid pressure h: 900
Del.quantity : 230.5...232.5
1000 : (227.5...235.5)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control Lever
position degrees: 55...63

Testing:

1st rack travel in: 13.10
Speed rpm : 1015...1025
2nd rack travel in: 4.00
Speed rpm : 1130...1160
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever
position degrees: 10...18

Testing:

Speed rpm : 275
Minimum rack trave: 6.00
Speed rpm : 325
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

Speed rpm : 325...600

TORQUE CONTROL

Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 975
Rack travel in m: 14.10...14.20
2nd speed rpm : 700
Rack travel in m: 13.70...13.90
3rd speed rpm : 600
Rack travel in m: 0.00...13.30

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 700
Pressure hPa : 900
Rack travel mm : 13.80...13.90

Measurement

Speed 1/min : 700

1st pressure hPa : -
Rack travel in m: 7.80...8.20
2nd pressure hPa : 240
Rack travel in m: 9.30...9.40

3rd pressure hPa : 510
Rack travel in m: 12.20...12.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 700
Del.quantity cm3/ : 237.0...233.0
1000 s: (224.0...236.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 125.0...129.0
1000 s: (123.0...131.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 13.10
Speed rpm : 1015...1025

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 110.0...150.0
1000 s: (100.0...160.0)
Rack travel in mm : 7.80...8.20

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm3/ : 38.0...44.0
1000 s: (36.0...46.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 a
Edition : 30.10.89
Replaces : 10.2.89
Test oil : ISO-4113

Combination no. : 0 402 746 836

Injection pump
Pump designation : PES6P120A72ORS7157
EP type number : 0 412 726 814
Governor
Governor design. : RQV325...900PA848-12
K

Governer no. : 0 421 815 192

Customer-spec. information
Customer : MACK

Engine : E7-400 4VH

1st version kW : 298.0
Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 2 417 413 011

Overflow
quantity min. 1/h: 160...170

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
(2.70...2.90)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
Phasing :
Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900
Rack travel in mm : 15.50...15.60
Del.quantity cm3/ : 27.2...27.4
100 s: (26.9...27.7)
Spread cm3 : 0.5
100 s: (0.9)

2nd speed rpm : 325.0
Rack travel in mm : 4.9...5.1
Del.quantity cm3/ : 4.3...4.9
100 s: (4.1...5.1)
Spread cm3 : 0.8
100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
travel mm : 1.30...1.60
2nd speed rpm : 500
travel mm : 3.40...4.00
3rd speed rpm : 900
travel mm : 6.70...6.90
4th speed rpm : 1075
travel mm : 8.40...8.90

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1120
Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 900
Aneroid pressure h: 1200

Del.quantity : 272.0...274.0
1000 : (269.0...277.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 56...64

Testing:
1st rack travel in: 14.50
Speed rpm : 940...950
2nd rack travel in: 4.00
Speed rpm : 1115...1145
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 10...18

Testing:
Speed rpm : 275
Minimum rack travel: 6.40
Speed rpm : 325
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION
Speed rpm : 325...500

TORQUE CONTROL
Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 900
Rack travel in m: 15.50...15.60
2nd speed rpm : 625
Rack travel in m: 15.30...15.50
3rd speed rpm : 500
Rack travel in m: 0.00...14.60

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 900
Pressure hPa : 1200
Rack travel mm : 15.50...15.60

Measurement
Speed 1/min : 900

1st pressure hPa : -
Rack travel in m: 8.20...8.60
2nd pressure hPa : 225
Rack travel in m: 9.40...9.50
3rd pressure hPa : 770

Rack travel in m: 13.80...14.20

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 625
Del.quantity cm3/ : 309.0...315.0
1000 s: (306.0...318.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 166.0...170.0
1000 s: (164.0...172.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 14.50
Speed rpm : 940...950

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 9.90...10.30

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.90...5.10
Del.quantity cm3/ : 43.0...49.0
1000 s: (41.0...51.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 a1
 Edition : 30.10.89
 Replaces : 10.2.89
 Test oil : ISO-4113

Combination no. : 0 402 746 837

Injection pump
 Pump designation : PES6P120A720RS7157
 EP type number : 0 412 726 814
 Governor
 Governor design. : RGV325...900PA848-15
 K
 Governor no. : 0 421 815 193

Customer-spec. information
 Customer : MACK

Engine : E7-350 4VH

1st version kW : 261.0
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 2 417 413 011

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Phasing :
 Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 14.00...14.10

Del.quantity cm³/ : 22.8...23.0
 100 s: (22.5...23.3)

Spread cm³ : 0.5
 100 s: (0.9)

2nd speed rpm : 325.0
 Rack travel in mm : 5.3...5.5
 Del.quantity cm³/ : 4.1...4.7
 100 s: (3.9...4.9)
 Spread cm³ : 0.8
 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.30...1.60
 2nd speed rpm : 500
 travel mm : 3.40...4.00
 3rd speed rpm : 900
 travel mm : 6.70...6.90
 4th speed rpm : 1075
 travel mm : 8.40...8.90

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1100
 Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 900
 Aneroid pressure h: 900

Del.quantity : 228.0...230.0
1000 : (225.0...233.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 56...64

Testing:
1st rack travel in: 13.00
Speed rpm : 950...960
2nd rack travel in: 4.00
Speed rpm : 1100...1130
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 10...18

Testing:
Speed rpm : 275
Minimum rack travel: 6.80
Speed rpm : 325
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION
Speed rpm : 325...500

TORQUE CONTROL

Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 900
Rack travel in m: 14.00...14.10
2nd speed rpm : 625
Rack travel in m: 13.80...14.00
3rd speed rpm : 500
Rack travel in m: 0.00...13.20

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 900
Pressure hPa : 900
Rack travel mm : 14.00...14.10

Measurement
Speed 1/min : 900

1st pressure hPa : -
Rack travel in m: 8.80...9.20
2nd pressure hPa : 225
Rack travel in m: 10.20...10.30
3rd pressure hPa : 545

Rack travel in m: 12.70...13.10

START CUT-OUT

Speed 1/min : 265 (275)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 625
Del.quantity cm³/ : 260.0...266.0
1000 s: (257.0...269.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 166.0...170.0
1000 s: (164.0...172.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack travel: 13.00
Speed rpm : 950...960

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 10.40...10.80

LOW IDLE

Speed rpm : 325
Rack travel in mm : 5.30...5.50
Del.quantity cm³/ : 41.0...47.0
1000 s: (39.0...49.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 a2
Edition : 30.10.89
Replaces : 10.2.89
Test oil : ISO-4113

Combination no. : 0 402 746 838

Injection pump
Pump designation : PES6P120A72ORS7157
EP type number : 0 412 726 814
Governor
Governor design. : RQV325...875PA848-14
K

Governer no. : 0 421 815 194

Customer-spec. information
Customer : MACK

Engine : EM7-250L 4VH

1st version kW : 187.0
Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil
inlet temp., C : 38...42

Overflow valve : 2 417 413 011

Overflow
quantity min. 1/h: 160...170

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
: (2.70...2.90)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
Phasing :
Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875
Rack travel in mm : 10.30...10.40
Del.quantity cm3/ : 17.3...17.5
100 s: (17.0...17.8)
Spread cm3 : 0.5
100 s: (0.9)

2nd speed rpm : 325.0
Rack travel in mm : 4.7...4.9
Del.quantity cm3/ : 4.1...4.7
100 s: (3.9...4.9)
Spread cm3 : 0.8
100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
travel mm : 1.30...1.60
2nd speed rpm : 500
travel mm : 3.40...4.00
3rd speed rpm : 900
travel mm : 6.70...6.90
4th speed rpm : 1075
travel mm : 8.40...8.90

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1120
Rack travel in mm : 6.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 875
Aneroid pressure h: 900

Del.quantity : 173.0...175.0
1000 : (170.0...178.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 52...60

Testing:

1st rack travel in: 9.30
Speed rpm : 915...925
2nd rack travel in: 4.00
Speed rpm : 1020...1050
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 10...18

Testing:

Speed rpm : 275
Minimum rack travel: 6.20
Speed rpm : 325
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION

Speed rpm : 325...500

TORQUE CONTROL

Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 10.30...10.40
2nd speed rpm : 510
Rack travel in m: 11.90...12.10
3rd speed rpm : 450
Rack travel in m: 0.00...11.80

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 510
Pressure hPa : 900
Rack travel mm : 11.90...12.10

Measurement

Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 8.30...8.70
2nd pressure hPa : 205
Rack travel in m: 9.30...9.40
3rd pressure hPa : 400

Rack travel in m: 11.00...11.40

START CUT-OUT

Speed 1/min : 265 (275)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 510
Del.quantity cm3/ : 244.0...250.0
1000 s: (241.0...253.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 168.0...172.0
1000 s: (166.0...174.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.30
Speed rpm : 915...925

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 9.80...10.20

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.70...4.90
Del.quantity cm3/ : 41.0...47.0
1000 s: (39.0...49.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 b
Edition : 30.10.89
Replaces : 10.2.89
Test oil : ISO-4113

Combination no. : 0 402 746 839

Injection pump
Pump designation : PES6P120A720RS7148
EP type number : 0 412 726 810
Governor
Governor design. : RQV325...875PA848-19
K
Governor no. : 0 421 815 199

Customer-spec. information
Customer : MACK

Engine : EM7 300L 4VH

1st version kW : 224.0
Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
: (2.70...2.90)
Rack travel in mm : 6.00...8.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 11.50...11.60

Del.quantity cm3/ : 21.0...21.2

100 s: (20.7...21.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0
Rack travel in mm : 4.5...4.7
Del.quantity cm3/ : 4.1...4.7
100 s: (3.9...4.9)
Spread cm3 : 0.8
100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
travel mm : 1.20...1.40
2nd speed rpm : 450
travel mm : 2.50...2.80
3rd speed rpm : 600
travel mm : 4.10...4.30
4th speed rpm : 875
travel mm : 7.30...7.50
5th speed rpm : 1000
travel mm : 8.70...9.00

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1030
Rack travel in mm : 6.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 875

Aneroid pressure h: 1200
Del.quantity : 210.0...212.0
1000 : (207.0...215.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 57...65

Testing:
1st rack travel in: 10.50
Speed rpm : 915...925
2nd rack travel in: 4.00
Speed rpm : 1000...1030
4th rack travel in: 1150
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 8...16

Testing:
Speed rpm : 275
Minimum rack travel: 6.00
Speed rpm : 325
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 11.50...11.60
2nd speed rpm : 510
Rack travel in m: 16.00...16.20
3rd speed rpm : 800
Rack travel in m: 12.00...12.20
4th speed rpm : 600
Rack travel in m: 15.10...15.30
5th speed rpm : 450
Rack travel in m: 0.00...15.70

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel mm : 16.00...16.20

Measurement
Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 8.70...9.10
2nd pressure hPa : 325
Rack travel in m: 10.60...10.70
3rd pressure hPa : 815
Rack travel in m: 14.30...14.70

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm³/ : 294.0...300.0
1000 s: (291.0...303.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 166.0...170.0
1000 s: (164.0...172.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.50
Speed rpm : 915...925

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 165.0...185.0
1000 s: (155.0...195.0)
Rack travel in mm : 8.70...9.10

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm³/ : 41.0...47.0
1000 s: (39.0...49.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1a12
 Edition : 30.10.89
 Replaces : 10.2.89
 Test oil : ISO-4113
 Combination no. : 0 402 746 840
 Injection pump
 Pump designation : PES6P120A720RS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...875PA848-18
 K
 Governor no. : 0 421 815 198

Customer-spec. information
 Customer : MACK

Engine : EMC6 250L 4VH
 1st version kW : 187.0
 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42
 Overflow valve : 2 417 413 011
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 1 688 901 101
 Opening
 pressure, bar : 207...210
 Orifice plate
 diameter mm : 0,6
 Test lines : 1 680 750 008
 Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600
 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - , : 0.50 (0.75)
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875
 Rack travel in mm : 11.20...11.30
 Del.quantity cm3/ : 17.3...17.5
 100 s: (17.0...17.8)
 Spread cm3 : 0.5
 100 s: (0.9)
 2nd speed rpm : 325.0
 Rack travel in mm : 4.5...4.7
 Del.quantity cm3/ : 3.9...4.5
 100 s: (3.7...4.7)
 Spread cm3 : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40
 2nd speed rpm : 450
 travel mm : 2.80...3.20
 3rd speed rpm : 850
 travel mm : 6.20...6.40
 4th speed rpm : 1000
 travel mm : 7.70...7.90

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1100
 Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 875
 Aneroid pressure h: 1200

Del.quantity : 173.0...175.0
1000 : (170.0...178.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 54...62

Testing:

1st rack travel in: 10.20
Speed rpm : 915...925
2nd rack travel in: 4.00
Speed rpm : 1010...1040
4th rack travel in: 1100
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 9...17

Testing:

Speed rpm : 275
Minimum rack travel: 6.00
Speed rpm : 325
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 11.20...11.30
2nd speed rpm : 510
Rack travel in m: 13.10...13.30
3rd speed rpm : 700
Rack travel in m: 12.00...12.20
4th speed rpm : 450
Rack travel in m: 0.00...13.10

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel mm : 13.10...13.30

Measurement

Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 9.10...9.50
2nd pressure hPa : 215

Rack travel in m: 10.30...10.40
3rd pressure hPa : 435
Rack travel in m: 12.20...12.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm3/ : 239.0...245.0
1000 s: (236.0...248.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 146.0...150.0
1000 s: (144.0...152.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack travel: 10.20
Speed rpm : 915...925

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 160.0...200.0
1000 s: (150.0...210.0)
Rack travel in mm : 9.10...9.50

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm3/ : 39.0...45.0
1000 s: (37.0...47.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 e
 Edition : 30.10.89
 Replaces : 10.2.89
 Test oil : ISO-4113
 Combination no. : 0 402 746 842
 Injection pump
 Pump designation : PES6P120A720RS7164
 EP type number : 0 412 726 816
 Governor
 Governor design. : RQV325...875PA848-17
 K
 Governor no. : 0 421 815 200

Customer-spec. information
 Customer : MACK

Engine : EMC6 300L 4VH

1st version kW : 200.0
 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 11.00...13.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 14.60...14.70

Del.quantity cm³/ : 21.9...22.1

100 s: (21.6...22.4)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 325.0
 Rack travel in mm : 4.3...4.5
 Del.quantity cm³/ : 3.9...4.5
 100 s: (3.7...4.7)
 Spread cm³ : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40
 2nd speed rpm : 450
 travel mm : 3.00...3.40
 3rd speed rpm : 850
 travel mm : 5.90...6.10
 4th speed rpm : 1000
 travel mm : 7.40...7.70

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1120
 Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 875
 Aneroid pressure h: 1200

Del.quantity : 219.0...221.0
1000 : (216.0...224.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 54...62

Testing:
1st rack travel in: 13.60
Speed rpm : 915...925
2nd rack travel in: 4.00
Speed rpm : 1060...1090
4th rack travel in: 1160
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 10...18

Testing:
Speed rpm : 275
Minimum rack travel: 5.80
Speed rpm : 325
Rack travel in mm : 4.30...4.50

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 14.60...14.70
2nd speed rpm : 510
Rack travel in m: 16.70...16.90
3rd speed rpm : 700
Rack travel in m: 15.30...15.50
4th speed rpm : 600
Rack travel in m: 16.00...16.20
5th speed rpm : 420
Rack travel in m: 0.00...16.80

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel mm : 16.70...16.90

Measurement
Speed 1/min : 510

1st pressure hPa : -

C20

Rack travel in m: 10.40...10.80
2nd pressure hPa : 375
Rack travel in m: 12.10...12.20
3rd pressure hPa : 735
Rack travel in m: 15.10...15.50

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm3/ : 304.0...310.0
1000 s: (301.0...313.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 156.0...160.0
1000 s: (154.0...162.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.60
Speed rpm : 915...925

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 160.0...200.0
1000 s: (150.0...210.0)
Rack travel in mm : 10.40...10.80

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.30...4.50
Del.quantity cm3/ : 39.0...45.0
1000 s: (37.0...47.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1a15
Edition : 31.10.89
Replaces : 7.4.89
Test oil : ISO-4113

Combination no. : 0 402 746 846

Injection pump
Pump designation : PES6P120A72ORS7135
EP type number : 0 412 726 807
Governor
Governor design. : RQV325...850PA848-23
K
Governor no. : 0 421 815 204

Customer-spec. information
Customer : MACK TRUCKS

Engine : E6 300 4VH

1st version kW : 224.0
Rated speed : 1700

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00x2.00x600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
: (2.70...2.90)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.90...13.00

Del.quantity cm3/ : 20.0...20.2

100 s: (19.7...20.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0
Rack travel in mm : 4.5...4.7
Del.quantity cm3/ : 3.2...3.8
100 s: (3.0...4.0)
Spread cm3 : 0.8
100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
travel mm : 1.20...1.40
2nd speed rpm : 450
travel mm : 2.80...3.10
3rd speed rpm : 850
travel mm : 6.20...6.40
4th speed rpm : 1000
travel mm : 7.70...7.90

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1100
Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 850
Aneroid pressure h: 900

Del.quantity : 200.0...202.0
1000 : (197.0...205.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 50...58

Testing:
1st rack travel in: 11.90
Speed rpm : 900...910
2nd rack travel in: 4.00
Speed rpm : 1025...1055
4th rack travel in: 1100
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 7...15

Testing:
Speed rpm : 275
Minimum rack travel: 6.00
Speed rpm : 325
Rack travel in mm : 4.50...4.70
Rack travel in mm : 2.00

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 850
Rack travel in m: 12.90...13.00
2nd speed rpm : 700
Rack travel in m: 13.60...13.70
3rd speed rpm : 600
Rack travel in m: 13.80...13.90
4th speed rpm : 500
Rack travel in m: 0.00...13.60

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 13.80...13.90

Measurement

Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 10.30...10.50
2nd pressure hPa : 250

Rack travel in m: 11.20...11.30
3rd pressure hPa : 475
Rack travel in m: 12.90...13.30

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 600
Del.quantity cm3/ : 237.0...243.0
1000 s: (234.0...246.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 154.0...158.0
1000 s: (152.0...160.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.90
Speed rpm : 900...910

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 195.0...235.0
1000 s: (185.0...245.0)
Rack travel in mm : 10.30...10.50

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm3/ : 32.0...38.0
1000 s: (30.0...40.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1a16
 Edition : 31.10.89
 Replaces : 7.4.89
 Test oil : ISO-4113

Combination no. : 0 402 746 847

Injection pump
 Pump designation : PES6P120A720RS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...850PA878-8K
 Governor no. : 0 421 815 205

Customer-spec. information
 Customer : MACK TRUCKS

Engine : E6 300 4VH

1st version kW : 224.0
 Rated speed : 1700

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.90...13.00

Del.quantity cm³/ : 20.0...20.2

100 s: (19.7...20.5)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm³/ : 3.2...3.8
 100 s: (3.0...4.0)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40

2nd speed rpm : 450
 travel mm : 2.80...3.10

3rd speed rpm : 850
 travel mm : 6.20...6.40

4th speed rpm : 1000
 travel mm : 7.70...7.90

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 200.0...202.0

1000 : (197.0...205.0)

Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 50...58

Testing:
1st rack travel in: 11.90
Speed rpm : 900...910
2nd rack travel in: 4.00
Speed rpm : 1025...1055
4th rack travel in: 1100
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 7...15

Testing:
Speed rpm : 275
Minimum rack travel: 6.00
Speed rpm : 325
Rack travel in mm : 4.50...4.70
Rack travel in mm : 2.00

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 850
Rack travel in m: 12.90...13.00
2nd speed rpm : 700
Rack travel in m: 13.60...13.70
3rd speed rpm : 600
Rack travel in m: 13.80...13.90
4th speed rpm : 500
Rack travel in m: 0.00...13.60

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 13.80...13.90

Measurement

Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 10.30...10.50
2nd pressure hPa : 250
Rack travel in m: 11.20...11.30
3rd pressure hPa : 475

Rack travel in m: 12.90...13.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 600
Del.quantity cm³/ : 237.0...243.0
 1000 s: (234.0...246.0)
Spread cm³ : 8.00
 1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 154.0...158.0
 1000 s: (152.0...160.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.90
Speed rpm : 900...910

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 195.0...235.0
 1000 s: (185.0...245.0)
Rack travel in mm : 10.30...10.50

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm³/ : 32.0...38.0
 1000 s: (30.0...40.0)
Spread cm³ : 8.00
 1000 s: (12.00)

Remarks:

:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1a17
 Edition : 31.10.89
 Replaces : 7.4.89
 Test oil : ISO-4113
 Combination no. : 0 402 746 849
 Injection pump
 Pump designation : PES6F120A720RS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...850PA878-10
 K
 Governor no. : 0 421 815 209

Customer-spec. information
 Customer : MACK TRUCKS

Engine : E6 275 4VH

1st version kW : 202.0
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 11.90...12.00

Del.quantity cm³/ : 18.3...18.5

100 s: (18.0...18.8)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm³/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40

2nd speed rpm : 450
 travel mm : 2.80...3.10

3rd speed rpm : 850
 travel mm : 6.20...6.40

4th speed rpm : 1000
 travel mm : 7.70...7.90

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 183.0...185.0
1000 : (180.0...188.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 50...58

Testing:

1st rack travel in: 10.90
Speed rpm : 900...910
2nd rack travel in: 4.00
Speed rpm : 1025...1055
4th rack travel in: 1100
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 7...15

Testing:

Speed rpm : 275
Minimum rack travel: 6.40
Speed rpm : 325
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 850
Rack travel in m: 11.90...12.90
2nd speed rpm : 700
Rack travel in m: 12.80...12.90
3rd speed rpm : 600
Rack travel in m: 13.00...13.10
4th speed rpm : 500
Rack travel in m: 0.00...12.80

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 13.00...13.10

Measurement

Speed 1/min : 600

1st pressure hPa : -

Rack travel in m: 10.30...10.50

2nd pressure hPa : 225

Rack travel in m: 11.00...11.10

3rd pressure hPa : 385
Rack travel in m: 12.20...12.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 600
Del.quantity cm³/ : 219.5...225.5
1000 s: (216.5...228.5)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 154.0...158.0
1000 s: (152.0...160.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.90
Speed rpm : 900...910

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 195.0...235.0
1000 s: (185.0...245.0)
Rack travel in mm : 10.30...10.50

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm³/ : 32.0...38.0
1000 s: (30.0...40.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1a13
Edition : 31.10.89
Replaces : 2.5.89
Test oil : ISO-4113

Combination no. : 0 402 746 851

Injection pump
Pump designation : PES6P120A72ORS7135
EP type number : 0 412 726 807
Governor
Governor design. : RQV325...850PA848-25
K
Governor no. : 0 421 815 208

Customer-spec. information
Customer : MACK TRUCKS

Engine : E6 275 4VH

1st version kW : 202.0
Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
: (2.70...2.90)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 11.90...12.00

Del. quantity cm³/ : 18.3...18.5

100 s: (18.0...18.8)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del. quantity cm³/ : 3.2...3.8
100 s: (3.0...4.0)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
travel mm : 1.20...1.40

2nd speed rpm : 450
travel mm : 2.80...3.10

3rd speed rpm : 850
travel mm : 6.20...6.40

4th speed rpm : 1000
travel mm : 7.70...7.90

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 183.0...185.0
1000 : (180.0...188.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 50...58

Testing:
1st rack travel in: 10.90
Speed rpm : 900...910
2nd rack travel in: 4.00
Speed rpm : 1025...1055
4th rack travel in: 1100
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 7...15

Testing:
Speed rpm : 275
Minimum rack trave: 6.40
Speed rpm : 325
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 850
Rack travel in m: 11.90...12.00
2nd speed rpm : 700
Rack travel in m: 12.80...12.90
3rd speed rpm : 600
Rack travel in m: 13.00...13.10
4th speed rpm : 500
Rack travel in m: 0.00...12.80

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 13.00...13.10

Measurement
Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 10.30...10.50
2nd pressure hPa : 225
Rack travel in m: 11.00...11.10

3rd pressure hPa : 385
Rack travel in m: 12.20...12.60

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 600
Del.quantity cm3/ : 219.5...225.5
1000 s: (216.5...228.5)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 154.0...158.0
1000 s: (152.0...160.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.90
Speed rpm : 900...910

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 195.0...235.0
1000 s: (185.0...245.0)
Rack travel in mm : 10.30...10.50

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm3/ : 32.0...38.0
1000 s: (30.0...40.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1a14
Edition : 31.10.89
Replaces : 2.5.89
Test oil : ISO-4113

Combination no. : 0 402 746 852

Injection pump
Pump designation : PES6P120A72ORS7157
EP type number : 0 412 726 814
Governor
Governor design. : RQV325...900PA909K
Governor no. : 0 421 815 210

Customer-spec. information
Customer : MACK TRUCKS

Engine : E7-400

1st version kW : 298.0
Rated speed : 1700

TEST BENCH REQUIREMENTS

Test oil
inlet temp., C : 38...42

Overflow valve : 2 417 413 011

Overflow
quantity min. 1/h: 160...170

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
: (2.70...2.90)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 15.80...15.90

Del.quantity cm3/ : 27.5...27.7

100 s: (27.2...28.0)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.7...4.9

Del.quantity cm3/ : 4.0...4.6

100 s: (3.8...4.8)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 650

travel mm : 5.60...5.80

4th speed rpm : 900

travel mm : 8.30...8.50

5th speed rpm : 1100

travel mm : 10.30...10.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1200

Del.quantity : 275.0...277.0

1000 : (272.0...280.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 58...66

Testing:
1st rack travel in: 14.80
Speed rpm : 940...950
2nd rack travel in: 4.00
Speed rpm : 1120...1150
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 7...15

Testing:
Speed rpm : 275
Minimum rack travel: 6.30
Speed rpm : 325
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 900
Rack travel in m: 15.80...15.90
2nd speed rpm : 625
Rack travel in m: 15.20...15.30
3rd speed rpm : 700
Rack travel in m: 15.50...15.60
4th speed rpm : 500
Rack travel in m: 0.00...13.50

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 900
Pressure hPa : 1200
Rack travel mm : 15.80...15.90

Measurement
Speed 1/min : 900

1st pressure hPa : -
Rack travel in m: 8.10...8.50
2nd pressure hPa : 325
Rack travel in m: 10.20...10.30
3rd pressure hPa : 790
Rack travel in m: 13.80...14.20

START CUT-OUT

Speed 1/min : 275 (285)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 625
Del.quantity cm³/ : 302.5...308.5
1000 s: (299.5...311.5)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 157.5...161.5
1000 s: (155.5...163.5)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 14.80
Speed rpm : 940...950

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 180.0...220.0
1000 s: (170.0...230.0)
Rack travel in mm : 10.40...10.60

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.70...4.90
Del.quantity cm³/ : 40.0...46.0
1000 s: (38.0...48.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 a4
 Edition : 31.10.89
 Replaces : 2.5.89
 Test oil : ISO-4113
 Combination no. : 0 402 746 853
 Injection pump
 Pump designation : PES6P120A720RS7157
 EP type number : 0 412 726 814
 Governor
 Governor design. : RQV325...900PA909-1K
 Governor no. : 0 421 815 211

Customer-spec. information
 Customer : MACK TRUCKS

Engine : E7-350

1st version kW : 261.0
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 2 417 413 011

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 5.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.80...13.90

Del.quantity cm3/ : 23.3...23.5

100 s: (23.0...23.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.7...4.9

Del.quantity cm3/ : 4.0...4.6

100 s: (3.8...4.8)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 650

travel mm : 5.60...5.80

4th speed rpm : 900

travel mm : 8.30...8.50

5th speed rpm : 1100

travel mm : 10.30...10.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1200

Del.quantity : 233.5...235.5

1000 : (230.5...238.5)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 58...66

Testing:
1st rack travel in: 12.80
Speed rpm : 940...950
2nd rack travel in: 4.00
Speed rpm : 1080...1110
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 7...15

Testing:
Speed rpm : 275
Minimum rack travel: 6.30
Speed rpm : 325
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 900
Rack travel in m: 13.80...13.90
2nd speed rpm : 625
Rack travel in m: 13.50...13.70
3rd speed rpm : 500
Rack travel in m: 11.50...11.90

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 900
Pressure hPa : 1200
Rack travel mm : 13.80...13.90

Measurement
Speed 1/min : 900

1st pressure hPa : -
Rack travel in m: 7.80...8.20
2nd pressure hPa : 325
Rack travel in m: 9.40...9.50
3rd pressure hPa : 685
Rack travel in m: 12.10...12.50

START CUT-OUT

Speed 1/min : 275 (285)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 625
Del.quantity cm3/ : 266.0...272.0
1000 s: (263.0...275.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 153.0...157.0
1000 s: (151.0...159.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.80
Speed rpm : 940...950

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 10.10...10.30

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.70...4.90
Del.quantity cm3/ : 40.0...46.0
1000 s: (38.0...48.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Bow dimension:
Sliding-sleeve position = 37.0 mm
Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 16,0 a
Edition : 31.10.89
Replaces : 1.9.89
Test oil : ISO-4113

Combination no. : 0 402 748 802

Injection pump
Pump designation : PES8P120A920/4LS7159
EP type number : 0 412 728 801
Governor
Governor design. : RQV325...1050PA848-21K
Governor no. : 0 421 815 201

Customer-spec. information
Customer : MACK

Engine : EE9 502

1st version kW : 368.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 2 417 413 011

Overflow
quantity min. 1/h: 160...170

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.55...3.65
: (3.50...3.70)
Rack travel in mm : 9.00...12.00
Firing order : 1- 2- 7- 8- 4- 5- 6- 3

Phasing : 0-45-90-135-180-225-270-315

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 630

Rack travel in mm : 11.90...12.00

Del.quantity cm3/ : 20.7...20.9
100 s: (20.4...21.2)

Spread cm3 : 0.5
100 s: (0.9)

2nd speed rpm : 325.0
Rack travel in mm : 4.8...5.0
Del.quantity cm3/ : 4.0...4.6
100 s: (3.8...4.8)
Spread cm3 : 0.8
100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
travel mm : 1.30...1.60
2nd speed rpm : 450
travel mm : 2.30...2.70
3rd speed rpm : 800
travel mm : 4.40...4.80
4th speed rpm : 1050
travel mm : 6.90...7.10
5th speed rpm : 1200
travel mm : 8.90...9.20

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1220
Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 630
Aneroid pressure h : 1200
Del.quantity : 207.0...209.0
1000 : (204.0...212.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 57...65

Testing:

1st rack travel in: 12.10
Speed rpm : 1095...1105
2nd rack travel in: 4.00
Speed rpm : 1180...1210
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 9...17

Testing:

Speed rpm : 275
Minimum rack travel: 6.30
Speed rpm : 325
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION

Speed rpm : 325...600

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 630
Rack travel in m: 11.90...12.00
2nd speed rpm : 1050
Rack travel in m: 13.10...13.30
3rd speed rpm : 500
Rack travel in m: 0.00...11.30

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 1050
Pressure hPa : 1200
Rack travel mm : 13.10...13.20

Measurement

Speed 1/min : 1050

1st pressure hPa : -
Rack travel in m: 8.40...8.80
2nd pressure hPa : 345

Rack travel in m: 9.90...10.00
3rd pressure hPa : 725
Rack travel in m: 12.00...12.40

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 1050
Del.quantity cm³/ : 202.0...208.0
1000 s: (199.0...211.0)
Spread cm³ : 10.00
1000 s: (14.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 154.0...158.0
1000 s: (152.0...160.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.10
Speed rpm : 1095...1105

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 140.0...180.0
1000 s: (130.0...190.0)
Rack travel in mm : 9.30...9.70

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.80...5.00
Del.quantity cm³/ : 40.0...46.0
1000 s: (38.0...48.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 D 7
Edition : 13.10.89
Replaces : 10.02.89
Test oil : ISO-4113

Combination no. : 0 403 436 109

Injection pump
Pump designation : PES6MW100/120RS1143
EP type number : 0 413 406 137
Governor
Governor design. : RQV300...1050MW82-4
Governor no. : 0 420 083 168

Cust. part no. : 3915581

Customer-spec. information
Customer : CUMMINS/US

Engine : 6 CTA-830

1st version kW : 175.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

D07

Test pressure, bar: 30...32

Prestroke mm : 3.05...3.15
: (3.00...3.20)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
Phasing :
Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050
Rack travel in mm : 12.60...12.70
Del. quantity cm³/ : 14.8...15.0
100 s: (14.6...15.2)
Spread cm³ : 0.3
100 s: (0.6)

2nd speed rpm : 300.0
Rack travel in mm : 7.7...7.9
Del. quantity cm³/ : 1.6...2.0
100 s: (1.3...2.2)
Spread cm³ : 0.3
100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1210
travel mm : 9.00...9.40
2nd speed rpm : 1100
travel mm : 7.90...8.10
3rd speed rpm : 550
travel mm : 3.00...3.60
4th speed rpm : 300
travel mm : 1.10...1.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1050
Aneroid pressure h: 900
Del. quantity : 148.0...150.0
1000 : (146.0...152.0)
Spread cm³ : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 42...50

Testing:

1st rack travel in: 11.60
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1185...1215
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 10...18
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 7.8

Testing:

Speed rpm : 100
Minimum rack travel: 9.30
Speed rpm : 300
Rack travel in mm : 7.70...7.90

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.50...9.70

Measurement

Speed 1/min : 500

1st pressure hPa : 300
Rack travel in m: 10.80...10.90
2nd pressure hPa : 520
Rack travel in m: 11.90...12.20
3rd pressure hPa : 900
Rack travel in m: 12.60...12.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 700
Del.quantity cm³/ : 145.5...148.5
1000 s: (143.0...151.0)
Spread cm³ : 5.00
1000 s: (7.0)

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 78.0...80.0
1000 s: (76.0...82.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.60
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 215.0...225.0
1000 s: (212.0...228.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 300
Rack travel in mm : 7.70...7.90
Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

: C.D.C. #3915581

Start-of-delivery mark/lock = 8.0,
angular displacement of the cam after
start of delivery of cylinder 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 D12
 Edition : 02.10.89
 Replaces : 30.05.89
 Test oil : ISO-4113
 Combination no. : 0 403 436 111
 Injection pump
 Pump designation : PES6MW100/120RS1143
 EP type number : 0 413 406 137
 Governor
 Governor design. : RQV350...1200MW82-6
 Governor no. : 0 420 083 184

Cust. part no. : 3916000

Customer-spec. information
 Customer : CUMMINS/US

Engine : 6 CTA-830
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 017

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.15...3.25
 : (3.10...3.30)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 12.10...12.20

Del.quantity cm3/ : 13.8...14.0

100 s: (13.6...14.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0
 Rack travel in mm : 7.1...7.3
 Del.quantity cm3/ : 1.2...1.6
 100 s: (1.0...1.8)
 Spread cm3 : 0.3
 100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1250
 travel mm : 7.60...7.80
 2nd speed rpm : 1350
 travel mm : 8.60...9.00
 3rd speed rpm : 350
 travel mm : 1.20...1.60
 4th speed rpm : 800
 travel mm : 4.90...5.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1200
 Aneroid pressure h: 700
 Del.quantity : 138.0...140.0
 1000 : (136.0...142.0)
 Spread cm3 : 3.50
 1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 42...50

Testing:

1st rack travel in: 11.10
Speed rpm : 1240...1250
2nd rack travel in: 4.00
Speed rpm : 1370...1400
4th rack travel in: 1455
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 11...19
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 7.2

Testing:

Speed rpm : 100
Minimum rack travel: 9.00
Speed rpm : 350
Rack travel in mm : 7.10...7.30

CONSTANT REGULATION

Speed rpm : 360...500

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1200
Rack travel in m: 12.10...12.20
2nd speed rpm : 750
Rack travel in m: 12.50...12.60
3rd speed rpm : 1000
Rack travel in m: 12.10...12.20
4th speed rpm : 900
Rack travel in m: 12.20...12.40

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : -
Rack travel mm : 11.00...11.10

Measurement

Speed 1/min : 500

1st pressure hPa : 390
Rack travel in m: 11.40...11.50
2nd pressure hPa : 480
Rack travel in m: 11.90...12.20
3rd pressure hPa : 700
Rack travel in m: 12.50...12.60

START CUT-OUT

Speed 1/min : 270 (280)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 750
Del.quantity cm³/ : 139.0...142.0
1000 s: (136.5...144.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 108.0...110.0
1000 s: (106.0...112.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.10
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 205.0...225.0
1000 s: (202.0...228.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 7.10...7.30
Del.quantity cm³/ : 12.0...16.0
1000 s: (10.0...18.0)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

: C.D.C. #3916000

Start-of-delivery mark at 10, cam
rotation angle after start of delivery,
cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL 4,5 K
Edition : 03.11.89
Replaces : 30.05.89
Test oil : ISO-4113

Combination no. : 0 403 444 108

Injection pump
Pump designation : PES4MW100/320RS1116
EP type number : 0 413 404 102
Governor
Governor design. : RQV300...1100MW51
Governor no. : 0 420 083 072

Customer-spec. information
Customer : VME

Engine : TD45

1st version kW : 88.5
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35
: (3.20...3.40)

Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270
Tolerance + - , : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.00...13.10

Del.quantity cm3/ : 12.0...12.2

100 s: (11.8...12.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0
Rack travel in mm : 5.8...6.0
Del.quantity cm3/ : 1.3...1.7
100 s: (1.0...1.9)
Spread cm3 : 0.3
100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1220
travel mm : 9.20...9.60
2nd speed rpm : 1150
travel mm : 8.40...8.60
3rd speed rpm : 420
travel mm : 1.70...2.30
4th speed rpm : 300
travel mm : 1.00...1.40

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1100
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 700
Aneroid pressure h: 1000
Del.quantity : 120.0...122.0
1000 : (118.0...124.0)
Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 48...56

Testing:

1st rack travel in: 12.00
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1200...1230
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 8...16
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.9

Testing:

Speed rpm : 100
Minimum rack travel: 8.00
Speed rpm : 300
Rack travel in mm : 5.80...6.00

CONSTANT REGULATION

Speed rpm : 330...450

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 700
Pressure hPa : 520
Rack travel mm : 12.90...13.00

Measurement

Speed 1/min : 700

1st pressure hPa : -

Rack travel in m: 11.00...11.10

2nd pressure hPa : 275

Rack travel in m: 11.10...11.40

3rd pressure hPa : 1000

Rack travel in m: 13.00...13.10

START CUT-OUT

Speed 1/min : 220 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

Speed rpm : 1000

Del.quantity cm3/ : 118.5...121.5
1000 s: (116.0...124.0)

Spread cm3 : 5.50
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 700
Del.quantity cm3/ : 85.0...87.0
1000 s: (83.0...89.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.00
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 130.0...140.0
1000 s: (127.0...143.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 5.80...6.00
Del.quantity cm3/ : 13.0...17.0
1000 s: (10.5...19.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL 4,5 L 1
 Edition : 03.11.89
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 444 109
 Injection pump
 Pump designation : PES4MW100/320RS1116
 EP type number : 0 413 404 102
 Governor
 Governor design. : RQV300...1100MW39-6
 Governor no. : 0 420 083 087

Customer-spec. information
 Customer : VME

Engine : TD45

1st version kW : 69.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., C : 38...42

Overflow valve
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35
 : (3.20...3.40)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270
 Tolerance + - , : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 700
 Rack travel in mm : 10.70...10.80

Del.quantity cm3/ : 8.5...8.7
 100 s: (8.3...8.9)

Spread cm3 : 0.3
 100 s: (0.6)

2nd speed rpm : 300.0
 Rack travel in mm : 5.8...6.0
 Del.quantity cm3/ : 1.3...1.7
 100 s: (1.0...1.9)
 Spread cm3 : 0.3
 100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1225
 travel mm : 9.40...9.80
 2nd speed rpm : 1150
 travel mm : 8.30...8.50
 3rd speed rpm : 600
 travel mm : 2.70...3.30
 4th speed rpm : 300
 travel mm : 1.00...1.40

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1130
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700
 Del.quantity : 85.0...87.0
 1000 : (83.0...89.0)
 Spread cm3 : 3.50
 1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 44...52

Testing:

1st rack travel in: 9.70
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1200...1230
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 10...18
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.9

Testing:

Speed rpm : 100
Minimum rack travel: 8.00
Speed rpm : 300
Rack travel in mm : 5.80...6.00

CONSTANT REGULATION

Speed rpm : 330...450

START CUT-OUT

Speed 1/min : 220 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1000
Del.quantity cm³/ : 87.5...90.5
1000 s: (85.0...93.0)
Spread cm³ : 5.50
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.70
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 130.0...140.0
1000 s: (127.0...143.0)

LOW IDLE

Speed rpm : 300

D14

Rack travel in mm : 5.80...6.00
Del.quantity cm³/ : 13.0...17.0
1000 s: (10.5...19.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL 4,5 L
 Edition : 03.11.89
 Replaces : 07.04.89
 Test oil : ISO-4113
 Combination no. : 0 403 444 111
 Injection pump
 Pump designation : PES4MM100/32ORS1116
 EP type number : 0 413 404 102
 Governor
 Governor design. : RQV300...1100MW39-5
 Governor no. : 0 420 083 068

Customer-spec. information
 Customer : VME

Engine : TD45

1st version kW : 88.5
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 173...176

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10
 : (2.95...3.15)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - , : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.00...13.10

Del.quantity cm3/ : 11.7...11.9

100 s: (11.5...12.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 1.3...1.7

100 s: (1.0...1.9)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1225
 travel mm : 9.40...9.80

2nd speed rpm : 1150
 travel mm : 8.30...8.50

3rd speed rpm : 600
 travel mm : 2.70...3.30

4th speed rpm : 300
 travel mm : 1.00...1.40

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 117.0...119.0

1000 : (115.0...121.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 44...52

Testing:

1st rack travel in: 12.00
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1225...1255
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 10...18
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.5

Testing:

Speed rpm : 100
Minimum rack trave: 8.00
Speed rpm : 300
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 320...450

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1000
Del.quantity cm3/ : 115.5...118.5
1000 s: (113.0...121.0)
Spread cm3 : 5.50
1000 s: (7.0)

RACK STOP ADJUSTMENT

Speed rpm : 100

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.00
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 150.0...160.0
1000 s: (147.0...163.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.40...6.60
Del.quantity cm3/ : 13.0...17.0
1000 s: (10.5...19.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 4,0 A 30
Edition : 02.10.89
Replaces : -
Test oil : ISO-4113
Combination no. : 0 403 444 116
Injection pump
Pump designation : PES4MW100/72ORS1127
EP type number : 0 413 404 103
Governor
Governor design. : RQV300...1400MW48-7
Governor no. : 0 420 083 172

Customer-spec. information
Customer : MB-NFZ

Engine : OM 364A

1st version kW : 70.0
Rated speed : 2800

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00x1.50x600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
: (3.65...3.85)
Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - , : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 10.00...10.10

Del. quantity cm³/ : 6.7...6.9

100 s: (6.5...7.1)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 7.9...8.1

Del. quantity cm³/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1550

travel mm : 9.00...9.40

2nd speed rpm : 1450

travel mm : 8.20...8.40

3rd speed rpm : 550

travel mm : 2.80...3.40

4th speed rpm : 300

travel mm : 1.00...1.40

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1450

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1400

Del. quantity : 67.0...69.0

1000 : (65.0...71.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 48...56

Testing:

1st rack travel in: 9.50
Speed rpm : 1450...1460
2nd rack travel in: 4.00
Speed rpm : 1540...1570
4th rack travel in: 1650
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 18...26
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 8.0

Testing:

Speed rpm : 100
Minimum rack travel: 9.50
Speed rpm : 300
Rack travel in mm : 7.90...8.10

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1400
Rack travel in m: 10.00...10.10
2nd speed rpm : 750
Rack travel in m: 10.80...10.90
3rd speed rpm : 950
Rack travel in m: 10.60...10.90
4th speed rpm : 1100
Rack travel in m: 10.20...10.50

START CUT-OUT

Speed 1/min : 200 (230)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750
Del.quantity cm³/ : 60.0...62.0
1000 s: (57.0...65.0)
Spread cm³ : 5.00
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.50
Speed rpm : 1450...1460

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 78.0...88.0
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 7.90...8.10
Del.quantity cm³/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 4,0 A 29
Edition : 02.10.89
Replaces : -
Test oil : ISO-4113
Combination no. : 0 403 444 117
Injection pump
Pump designation : PES4MW100/72ORS1127
EP type number : 0 413 404 103
Governor
Governor design. : RQV300...1400MW48-10
Governor no. : 0 420 083 178

Customer-spec. information
Customer : MB-NFZ

Engine : OM 364A

1st version kW : 85.0
Rated speed : 2800

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
: (3.45...3.65)
Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - , : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 11.50...11.60

Del. quantity cm³/ : 7.9...8.1

100 s: (7.7...8.3)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 8.9...9.1

Del. quantity cm³/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1550
travel mm : 9.00...9.40

2nd speed rpm : 1450
travel mm : 8.30...8.50

3rd speed rpm : 550
travel mm : 2.80...3.40

4th speed rpm : 300
travel mm : 1.00...1.40

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1

Speed rpm : 1450

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1400
Del. quantity : 79.0...81.0
1000 : (77.0...83.0)
Spread cm³ : 3.50
1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 48...56

Testing:

1st rack travel in: 10.50
Speed rpm : 1440...1450
2nd rack travel in: 4.00
Speed rpm : 1540...1570
4th rack travel in: 1650
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 18...26
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 9.0

Testing:

Speed rpm : 100
Minimum rack travel: 10.50
Speed rpm : 300
Rack travel in mm : 8.90...9.10

TORQUE CONTROL

Dimension a mm : 1.30
Torque control curve - 1st version
1st speed rpm : 1400
Rack travel in m: 11.50...11.60
2nd speed rpm : 750
Rack travel in m: 12.80...12.90
3rd speed rpm : 950
Rack travel in m: 12.40...12.60
4th speed rpm : 1100
Rack travel in m: 12.00...12.30

START CUT-OUT

Speed 1/min : 200 (230)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750
Del.quantity cm3/ : 75.0...77.0
1000 s: (73.0...79.0)
Spread cm3 : 5.00
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.50
Speed rpm : 1440...1450

STARTING FUEL DELIVERY

D20

Speed rpm : 100
Del.quantity cm3/ : 78.0...88.0
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 8.90...9.10
Del.quantity cm3/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 47
 Edition : 13.06.88
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 446 156
 Injection pump
 Pump designation : PES6MW100/720RS1120
 EP type number : 0 413 406 112
 Governor
 Governor design. : RQV300...1300MW59
 Governor no. : 0 420 083 077

Customer-spec. information
 Customer : DB

Engine : OM366LA

1st version kW : 141.7
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
 : (3.45...3.65)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + -, : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 12.10...12.20

Del.quantity cm³/ : 8.6...8.8

100 s: (8.4...9.0)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.1

Del.quantity cm³/ : 0.9...1.3

100 s: (0.7...1.5)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.50...9.90

2nd speed rpm : 1350

travel mm : 8.50...8.70

3rd speed rpm : 450

travel mm : 2.40...3.00

4th speed rpm : 300

travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1340

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 86.0...88.0

1000 : (84.0...90.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 48...56

Testing:
1st rack travel in: 11.10
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1440...1470
4th rack travel in: 1530
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 16...24
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.0

Testing:
Speed rpm : 100
Minimum rack travel: 8.00
Speed rpm : 300
Rack travel in mm : 6.00...6.10

CONSTANT REGULATION
Speed rpm : 320...550

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 260
Rack travel mm : 11.00...11.10

Measurement
Speed 1/min : 500

1st pressure hPa : 700
Rack travel in m: 12.00...12.10
2nd pressure hPa : -
Rack travel in m: 10.80...10.90
3rd pressure hPa : 310
Rack travel in m: 11.70...12.00

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 700
Speed rpm : 750
Del.quantity cm3/ : 75.5...78.5
1000 s: (73.0...81.0)

Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 47.0...49.0
1000 s: (45.0...51.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.10
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 83.0...93.0
1000 s: (80.0...96.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.00...6.10
Del.quantity cm3/ : 9.0...13.0
1000 s: (7.0...15.0)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 26
Edition : 06.10.89
Replaces : 29.04.88
Test oil : ISO-4113

Combination no. : 0 403 446 177

Injection pump
Pump designation : PES6MW100/720RS1144
EP type number : 0 413 406 138
Governor
Governor design. : RQV300...1300MW48
Governor no. : 0 420 083 066

Customer-spec. information
Customer : DB

Engine : OM366A

1st version kW : 125.0
Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
: (3.65...3.85)
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 11.00...11.10

Del. quantity cm³/ : 7.7...7.9

100 s : (7.5...8.1)

Spread cm³ : 0.3

100 s : (0.6)

2nd speed rpm : 300.0
Rack travel in mm : 7.8...7.9
Del. quantity cm³/ : 0.9...1.3
100 s : (0.6...1.5)
Spread cm³ : 0.3
100 s : (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1430
travel mm : 9.30...9.70
2nd speed rpm : 1340
travel mm : 8.50...8.70
3rd speed rpm : 500
travel mm : 2.70...3.30
4th speed rpm : 300
travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1280
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1300
Del. quantity : 77.0...79.0
1000 : (75.0...81.0)
Spread cm³ : 3.50
1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 50...58

Testing:

1st rack travel in: 10.00
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1425...1455
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 18...26
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 7.8

Testing:

Speed rpm : 100
Minimum rack travel: 8.70
Speed rpm : 300
Rack travel in mm : 7.80...7.90

CONSTANT REGULATION

Speed rpm : 330...500

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1300
Rack travel in m: 11.00...11.10
2nd speed rpm : 800
Rack travel in m: 11.80...12.00
3rd speed rpm : 585
Rack travel in m: 12.00...12.20
4th speed rpm : 1100
Rack travel in m: 11.00...11.10

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800
Del.quantity cm³/ : 76.0...78.0
1000 s: (74.0...80.0)
Spread cm³ : 5.00
1000 s: (7.0)
Speed rpm : 585
Del.quantity cm³/ : 68.5...71.5
1000 s: (66.0...74.0)
Spread cm³ : 5.00
1000 s: (7.00)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.00
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 78.0...88.0
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 7.80...7.90
Del.quantity cm³/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 77
 Edition : 02.10.89
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 446 225
 Injection pump
 Pump designation : PES6MW100/72ORS1144-
 1
 EP type number : 0 413 406 159
 Governor
 Governor design. : RQV300...1400MW48-11
 Governor no. : 0 420 083 190

Customer-spec. information
 Customer : MB-NFZ

Engine : OM366A

1st version kW : 125.0
 Rated speed : 2800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 10.90...11.00

Del.quantity cm3/ : 7.5...7.7

100 s: (7.3...7.9)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 7.8...8.3

Del.quantity cm3/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1550

travel mm : 9.20...9.60

2nd speed rpm : 1450

travel mm : 8.30...8.50

3rd speed rpm : 550

travel mm : 2.80...3.40

4th speed rpm : 300

travel mm : 1.00...1.40

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1450

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1400

Del.quantity : 75.0...77.0

1000 : (73.0...79.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 48...56

Testing:
1st rack travel in: 9.90
Speed rpm : 1440...1450
2nd rack travel in: 4.00
Speed rpm : 1530...1560
4th rack travel in: 1650
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 16...24
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 8.0

Testing:
Speed rpm : 100
Minimum rack travel: 9.50
Speed rpm : 300
Rack travel in mm : 7.80...8.30

TORQUE CONTROL
Dimension a mm : 0.60
Torque control curve - 1st version
1st speed rpm : 1400
Rack travel in m: 10.90...11.00
2nd speed rpm : 800
Rack travel in m: 11.50...11.70
3rd speed rpm : 1000
Rack travel in m: 11.10...11.40

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 800
Del.quantity cm3/ : 67.5...70.5
1000 s: (65.0...73.0)
Spread cm3 : 5.00
1000 s: (7.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 9.90
Speed rpm : 1440...1450

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 80.0...90.0
1000 s: (77.0...93.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 7.80...8.30
Del.quantity cm3/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:
:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 71
Edition : 13.10.89
Replaces : -
Test oil : ISO-4113
Combination no. : 0 403 446 226
Injection pump
Pump designation : PES6MW100/720RS1131-
1
EP type number : 0 413 406 165
Governor
Governor design. : RQ300/1300MW105
Governor no. : 0 420 082 039

Customer-spec. information
Customer : DB-NKW

Engine : OM366LA

1st version kW : 177.0
Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
: (3.45...3.65)

Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 14.60...14.70

Del.quantity cm³/ : 12.0...12.2

100 s: (11.8...12.4)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.5

Del.quantity cm³/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1460

travel mm : 9.70...10.10

2nd speed rpm : 1360

travel mm : 7.20...7.40

3rd speed rpm : 520

travel mm : 4.00...4.60

4th speed rpm : 300

travel mm : 1.30...1.70

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 1200

Rack travel in mm : 14.70...16.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1000

Del.quantity : 120.0...122.0

1000 : (118.0...124.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 38...46

Setting point:
Speed rpm : 1200
Rack travel in mm : 15.5

Testing:
1st rack travel in: 13.60
Speed rpm : 1345...1360
2nd rack travel in: 4.00
Speed rpm : 1450...1480
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 8...16
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.4

Testing:
Speed rpm : 100
Minimum rack travel: 9.00
Speed rpm : 300
Rack travel in mm : 6.30...6.50

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.60...10.70

Measurement
Speed 1/min : 500

1st pressure hPa : 200
Rack travel in m: 10.90...11.10
2nd pressure hPa : 500
Rack travel in m: 13.50...13.70
3rd pressure hPa : 1000
Rack travel in m: 14.60...14.70

START CUT-OUT

Speed 1/min : 180 (200)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000
Speed rpm : 750

Del.quantity cm3/ : 111.0...115.0
1000 s: (109.0...117.0)
Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 41.0...43.0
1000 s: (39.0...45.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 13.60
Speed rpm : 1345...1360

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 100.0...110.0
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.30...6.50
Del.quantity cm3/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 7,6 U
Edition : 13.10.89
Replaces : -
Test oil : ISO-4113
Combination no. : 0 403 446 227
Injection pump
Pump designation : PES6MW100/320RS1182
EP type number : 0 413 406 167
Governor
Governor design. : RQV350...1200MW46-19
Governor no. : 0 420 083 191

Customer spec. information
Customer : NAVISTAR

Engine : DTA-466

1st version kW : 182.0
Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10
 : (3.95...4.15)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.90...13.00

Del. quantity cm³/ : 13.6...13.8

100 s: (13.4...14.0)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.3...6.5

Del. quantity cm³/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350
travel mm : 8.30...8.50

2nd speed rpm : 1460
travel mm : 9.10...9.50

3rd speed rpm : 550
travel mm : 3.10...3.70

4th speed rpm : 350
travel mm : 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 800
Aneroid pressure h: 800
Del. quantity : 136.5...138.5
1000 : (134.5...140.5)
Spread cm³ : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 43...51

Testing:

1st rack travel in: 11.90
Speed rpm : 1260...1280
2nd rack travel in: 4.00
Speed rpm : 1395...1405
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 8...16
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.4

Testing:

Speed rpm : 100
Minimum rack travel: 9.00
Speed rpm : 350
Rack travel in mm : 6.30...6.50

CONSTANT REGULATION

Speed rpm : 300...450

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 800
Pressure hPa : 220
Rack travel mm : 11.00...11.10

Measurement

Speed 1/min : 800

1st pressure hPa : -
Rack travel in m: 10.20...10.40
2nd pressure hPa : 450
Rack travel in m: 12.10...12.40
3rd pressure hPa : 800
Rack travel in m: 12.90...13.00

START CUT-OUT

Speed 1/min : 180 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 800
Speed rpm : 1200
Del.quantity cm³/ : 133.0...137.0
1000 s: (131.0...139.0)
Spread cm³ : 6.50
1000 s: (7.0)
Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm³/ : 88.0...90.0
1000 s: (86.0...92.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.90
Speed rpm : 1260...1280

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 140.0...180.0
1000 s: (137.0...183.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.30...6.50
Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

Only perform pump setting with original
overflow valve without IH hose and
restrictor 1.2 mm diameter.
Before checking sleeve position,
first adjust latching.

In unlatched condition, do not
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before
shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 7,6 U 1
Edition : 02.10.89
Replaces : -
Test oil : ISO-4113

Combination no. : 0 403 446 228

Injection pump
Pump designation : PES6MM100/320RS1182
EP type number : 0 413 406 167
Governor
Governor design. : RQV350...1300MW46-20
Governor no. : 0 420 083 192

Cust. part no. : 1815267C91

Customer spec. information
Customer : NAVISTAR

Engine : DTA-466

1st version kW : 156.0
Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

E03

Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10
: (3.95...4.15)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
Phasing :
Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900
Rack travel in mm : 11.90...12.00
Del. quantity cm³/ : 11.9...12.1
100 s: (11.7...12.3)
Spread cm³ : 0.3
100 s: (0.6)

2nd speed rpm : 350.0
Rack travel in mm : 6.2...6.4
Del. quantity cm³/ : 1.4...1.8
100 s: (1.1...2.0)
Spread cm³ : 0.3
100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1460
travel mm : 9.10...9.50
2nd speed rpm : 1350
travel mm : 8.30...8.50
3rd speed rpm : 550
travel mm : 3.10...3.70
4th speed rpm : 350
travel mm : 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 900
Aneroid pressure h: 800
Del. quantity : 119.0...121.0
1000 : (117.0...123.0)
Spread cm³ : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 43...51

Testing:
1st rack travel in: 10.90
Speed rpm : 1360...1380
2nd rack travel in: 4.00
Speed rpm : 1480...1490
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 9...17
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.3

Testing:
Speed rpm : 100
Minimum rack travel: 9.00
Speed rpm : 350
Rack travel in mm : 6.20...6.40

CONSTANT REGULATION
Speed rpm : 300...450

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 800
Rack travel mm : 11.90...12.00

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.20...10.30
2nd pressure hPa : 165
Rack travel in m: 10.70...10.80
3rd pressure hPa : 360
Rack travel in m: 11.30...11.60

START CUT-OUT

Speed 1/min : 180 (200)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 800
Speed rpm : 1300

Del.quantity cm³/ : 120.0...123.0
1000 s: (117.5...125.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 88.0...90.0
1000 s: (86.0...92.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.90
Speed rpm : 1360...1380

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 140.0...180.0
1000 s: (137.0...183.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.20...6.40
Del.quantity cm³/ : 14.0...18.0
1000 s: (11.5...20.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:
: I.H.C. #1815267C91
Only perform pump setting with original
overflow valve without IH hose and
restrictor 1.2 mm diameter.
Before checking sleeve position,
first adjust latching.

In unlatched condition, do not
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before
shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 7,6 U 2
Edition : 02.10.89
Replaces : -
Test oil : ISO-4113

Combination no. : 0 403 446 229

Injection pump
Pump designation : PES6MW100/32ORS1182
EP type number : 0 413 406 167
Governor
Governor design. : RQV350...1200MW64-1
Governor no. : 0 420 083 193

Cust. part no. : 1815224C91

Customer-spec. information
Customer : NAVISTAR

Engine : DTA-466

1st version kW : 164.0
Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10
: (3.95...4.15)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
Phasing :
Tolerance + - , : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 11.90...12.00

Del.quantity cm3/ : 11.9...12.1
100 s: (11.7...12.3)

Spread cm3 : 0.3
100 s: (0.6)

2nd speed rpm : 350.0
Rack travel in mm : 6.2...6.4
Del.quantity cm3/ : 1.4...1.8
100 s: (1.1...2.0)
Spread cm3 : 0.3
100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350
travel mm : 8.30...8.50
2nd speed rpm : 1460
travel mm : 9.10...9.50
3rd speed rpm : 550
travel mm : 3.10...3.70
4th speed rpm : 350
travel mm : 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1200
Aneroid pressure h: 800
Del.quantity : 119.5...121.5
1000 : (117.5...123.5)
Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version

Control Lever
position degrees: 43...51

Testing:

1st rack travel in: 10.90
Speed rpm : 1255...1275
2nd rack travel in: 4.00
Speed rpm : 1375...1385
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever
position degrees: 10...18
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.3

Testing:

Speed rpm : 100
Minimum rack travel: 9.00
Speed rpm : 350
Rack travel in mm : 6.20...6.40

CONSTANT REGULATION

Speed rpm : 360...450

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1200
Rack travel in m: 11.90...12.00
2nd speed rpm : 800
Rack travel in m: 12.20...12.30
3rd speed rpm : 1150
Rack travel in m: 11.90...12.00
4th speed rpm : 950
Rack travel in m: 12.20...12.30

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 215
Rack travel mm : 10.90...11.00

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.40...10.50
2nd pressure hPa : 400
Rack travel in m: 11.70...12.00
3rd pressure hPa : 800
Rack travel in m: 12.20...12.30

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 800
Speed rpm : 800
Del.quantity cm³/ : 122.0...126.0
1000 s: (120.0...128.0)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 91.0...93.0
1000 s: (89.0...95.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.90
Speed rpm : 1255...1275

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 140.0...180.0
1000 s: (137.0...183.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.20...6.40
Del.quantity cm³/ : 14.0...18.0
1000 s: (11.5...20.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

: I.H.C. #1815224C91

Only perform pump setting with original
overflow valve without IH hose and
restrictor 1.2 mm diameter.
Before checking sleeve position,
first adjust latching.

In unlatched condition, do not
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before
shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 8,7 p 2
Edition : 20.6.88
Replaces : 12.9.86
Test oil : ISO-4113

Combination no. : 0 403 546 008

Injection pump
Pump designation : PE6MW100/720RS1126
EP type number : 0 413 506 101
Governor
Governor design. : RQ300/1250MW12-2
Governor no. : 0 420 082 020

Customer-spec. information
Customer : DAIMLER BENZ

Engine : OM360A

1st version kW : 147.00
Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar : 30...32
Prestroke mm : 3.80...3.90
: (3.75...3.95)
Rack travel in mm : 9.00...12.00
Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
0-60-120-180-240-300
Tolerance + - , : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1250
Rack travel in mm : 12.90...13.00
Del.quantity cm³/ : 9.70...9.90
100 s : (9.50...10.10)
Spread cm³ : 0.35
100 s : (0.60)

2nd speed rpm : 300
Rack travel in mm : 8.60...8.70
Del.quantity cm³/ : 1.00...1.40
100 s : (0.70...1.60)
Spread cm³ : 0.35
100 s : (0.50)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -2
Speed rpm : 650
Rack travel in mm : 13.10...13.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1250
Del.quantity : 97.00...99.00
1000 : (95.0...101.0)
Spread cm³ : 3.50
1000 : (6.00)

RATED SPEED

1st version
Setting point:
Speed rpm : 650
Rack travel in mm : 13.5

Testing:
1st rack travel in: 11.90
Speed rpm : 1295...1310
2nd rack travel in: 4.00
Speed rpm : 1415...1445
3rd rack travel in: 0.10...1.00
Speed rpm : 1550

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 8.60...8.70

Testing:

Speed rpm : 220
Minimum rack trave: 10.40
Speed rpm : 300
Rack travel in mm : 8.60...8.70
Rack travel in mm : 2.00
Speed rpm : 430...470

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : YDA 7,3 d
Edition : 08.08.89
Replaces : -
Test oil : ISO-4113

Combination no. : 9 400 030 451

Injection pump
Pump designation : PES6A95D310/3LS2636
Governor
Governor design. : RSV250...900A7B685L

Customer-spec. information
Customer : RUSTON & HORNSBY

Engine : 6 YDX MK 2

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.5

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x wall thickness
x Length mm : 6,00x1,50x600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Prestroke mm : 2,15...2,25
: (2,10...2,30)
Rack travel in mm : 9,00...12,00
Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
Tolerance + - , : 0,50 (0,75)

E09

BASIC SETTING

1st speed rpm : 1000
Rack travel in mm : 9,00
Del. quantity cm³/ : 6,2...7,7
100 s : (-)

Spread cm³ : 0,4
100 s : (-)

2nd speed rpm : 200
Rack travel in mm : 6,00
Del. quantity cm³/ : 0,4...1,5
100 s : (-)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -3
Speed rpm : 800
Rack travel in mm : 0,30...0,70

Governor spring pre-tension
Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 750
Del. quantity : 121,0...123,0
1000 : (119,0...125,0)

RATED SPEED

1st version
Control Lever
position degrees: 38...46

Testing:
1st rack travel in: 11,0
Speed rpm : 760...765
2nd rack travel in: 5,50
Speed rpm : <790
4th rack travel in: 930
Speed rpm : 0,30...1,70

LOW IDLE 1

Control lever
position degrees: 8...16
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 6,00

Testing:
Speed rpm : 100
Minimum rack travel: 17,00

Speed rpm : 250
Rack travel in mm : 5,80...6,20
Rack travel in mm : 2,00
Speed rpm : 420...470

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 8,00
Speed rpm : 760...765

HIGH IDLE

1st version
Speed rpm : <800
Rack travel in mm : 5,50

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 3,9 a
 Edition : 15.08.89
 Replaces : 4.85
 Test oil : ISO-4113
 Combination no. : 9 400 085 240
 Injection pump
 Pump designation : PES4A90D320RS2702
 EP type number : 9 400 083 095
 Governor
 Governor design. : RSV350...1150A2B2129
 -4R
 Governor no. : 9 420 083 193

Customer-spec. information
 Customer : MWM

Engine : D 229-4

1st version kW : 75.0
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 003

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.65...2.75
 : (2.60...2.80)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference, CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 9.00...9.10

Del.quantity cm³/ : 6.3...6.4

100 s: (6.1...6.6)

Spread cm³ : 0.3

100 s: (0.5)

2nd speed rpm : 350.0

Rack travel in mm : 5.6...5.8

Del.quantity cm³/ : 1.0...1.4

100 s: (0.8...1.6)

Spread cm³ : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 63.5...64.5

1000 : (61.5...66.5)

Spread cm³ : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever
position degrees: 45...53

Testing:

1st rack travel in: 8.00
Speed rpm : 1190...1200
2nd rack travel in: 4.00
Speed rpm : 1230...1260
4th rack travel in: 1400
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 20...28
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.2

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 350
Rack travel in mm : 5.60...5.80
Rack travel in mm : 2.00
Speed rpm : 560...620

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1150
Rack travel in m: 9.00...9.10
2nd speed rpm : 500
Rack travel in m: 10.10...10.20
3rd speed rpm : 800
Rack travel in m: 9.70...9.90
4th speed rpm : 1000
Rack travel in m: 9.10...9.40

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500
Del.quantity cm3/ : 61.0...63.0
1000 s: (59.5...64.5)
Speed rpm : 800
Del.quantity cm3/ : 66.0...68.0
1000 s: (63.5...70.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.00
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100
Rack travel in mm : 19.00...21.00

Remarks:

: VALMET

APPLICATION

Tractor (tractor engines)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 e
Edition : 01.09.88
Replaces : 8.1.88
Test oil : ISO-4113

Combination no. : 9 400 085 288

Injection pump
Pump designation : PES6A90D410RS2596-1
EP type number : 9 400 084 008
Governor
Governor design. : RQV300...1300AB1066-3L
Governor no. : 9 420 080 230

Customer-spec. information
Customer : DAIMLER-BENZ

Engine : OM 366 A

1st version kW : 127.0
Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10
: (1.95...2.15)

Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 13.10...13.20

Del.quantity cm³/ : 8.6...8.7

100 s: (8.4...8.9)

Spread cm³ : 0.3

100 s: (0.5)

2nd speed rpm : 300.0

Rack travel in mm : 8.4...8.6

Del.quantity cm³/ : 1.0...1.4

100 s: (0.8...1.6)

Spread cm³ : 0.2

100 s: (0.4)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1375

travel mm : 8.40...8.50

2nd speed rpm : 300

travel mm : 0.90...1.30

3rd speed rpm : 500

travel mm : 2.20...2.60

4th speed rpm : 800

travel mm : 4.30...4.70

5th speed rpm : 1100

travel mm : 6.10...6.40

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1375

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1000

Del.quantity : 86.0...87.0

1000 : (84.0...89.0)

Spread cm³ : 3.00
1000 : (5.00)

RATED SPEED

1st version
Control lever
position degrees: 60...68

Testing:

1st rack travel in: 12.10
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1470...1500
4th rack travel in: 1600
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 19...27

Testing:

Speed rpm : 100
Minimum rack travel: 10.00
Speed rpm : 300
Rack travel in mm : 8.40...8.60
Rack travel in mm : 2.00
Speed rpm : 570...630

CONSTANT REGULATION

Speed rpm : 590...660

TORQUE CONTROL

Dimension a mm : 1.00
Torque control curve - 1st version
1st speed rpm : 1300
Rack travel in m: 13.10...13.20
2nd speed rpm : 800
Rack travel in m: 14.10...14.20
3rd speed rpm : 1000
Rack travel in m: 13.90...14.10
4th speed rpm : 1150
Rack travel in m: 13.30...13.60

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 1000
Rack travel mm : 14.10...14.20

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 12.80...12.90
2nd pressure hPa : 750

Rack travel in m: 13.90...14.00
3rd pressure hPa : 650
Rack travel in m: 13.20...13.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 800
Del.quantity cm³/ : 89.0...91.0
1000 s: (86.5...93.5)
Aneroid pressure h: 1000
Speed rpm : 1000
Del.quantity cm³/ : 90.0...92.0
1000 s: (87.5...94.5)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 66.5...68.5
1000 s: (64.5...70.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.10
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 71.0...81.0
1000 s: (68.0...84.0)
Rack travel in mm : 14.70...15.70

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FOR 6,6 L 1
 Edition : 02.05.89
 Replaces : 1.9.88
 Test oil : ISO-4113
 Combination no. : 9 400 085 298
 Injection pump
 Pump designation : PES6A95D410RS2758
 EP type number : 9 400 084 016
 Governor
 Governor design. : RGV350...1300AB1220-3L
 Governor no. : 9 420 080 253

Customer-spec. information
 Customer : FORD FNH

Engine : 6,6 L

1st version kW : 123.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 1 688 901 017
 Opening
 pressure, bar : 207...210
 Orifice plate
 diameter mm : 0,6
 Test lines : 1 680 750 015
 Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600
 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 3.15...3.25
 : (3.10...3.30)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - , : 0.50 (0.75)
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1300
 Rack travel in mm : 13.20...13.30
 Del.quantity cm3/ : 9.8...10.0
 100 s: (9.6...10.2)
 Spread cm3 : 0.3
 100 s: (0.6)

2nd speed rpm : 350.0
 Rack travel in mm : 7.1...7.3
 Del.quantity cm3/ : 2.0...2.4
 100 s: (1.7...2.6)
 Spread cm3 : 0.3
 100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1335
 travel mm : 8.00...8.10
 2nd speed rpm : 350
 travel mm : 1.20...1.60
 3rd speed rpm : 500
 travel mm : 2.90...3.30
 4th speed rpm : 1000
 travel mm : 5.30...5.70

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1530
 Rack travel in mm : 8.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1300
 Aneroid pressure h: 900

Del.quantity : 98.0...100.0
1000 : (96.0...102.0)
Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 112...120

Testing:

1st rack travel in: 12.20
Speed rpm : 1360...1370
2nd rack travel in: 4.00
Speed rpm : 1500...1530
4th rack travel in: 1650
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 67...75

Testing:

Speed rpm : 100
Minimum rack travel: 10.00
Speed rpm : 350
Rack travel in mm : 7.10...7.30
Rack travel in mm : 2.00
Speed rpm : 680...740

CONSTANT REGULATION

Speed rpm : 370...440

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 13.20...13.30

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 10.50...10.70

2nd pressure hPa : 353

Rack travel in m: 11.20...11.30

3rd pressure hPa : 473

Rack travel in m: 12.40...12.80

START CUT-OUT

Speed 1/min : 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 800
Del.quantity cm3/ : 87.0...91.0
1000 s: (85.0...93.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 55.0...57.0
1000 s: (53.0...59.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.20
Speed rpm : 1360...1370

INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 145.0...165.0
1000 s: (140.0...170.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 7.10...7.30
Del.quantity cm3/ : 20.0...24.0
1000 s: (17.5...26.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

Set shutoff stop 1.5...2.0 mm before shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 g
 Edition : 15.08.89
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 085 305
 Injection pump
 Pump designation : PES6A95D410RS2772
 EP type number : 9 400 084 018
 Governor
 Governor design. : RQV300...1300AB1066-6L
 Governor no. : 9 420 080 265

Customer-spec. information
 Customer : DAIMLER-BENZ

Engine : OM 366 A

1st version kW : 125.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 1 417 413 006

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.40...10.50

Del.quantity cm3/ : 8.7...8.9

100 s: (8.5...9.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.9...7.1

Del.quantity cm3/ : 1.2...1.8

100 s: (1.0...2.0)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.80...1.30

2nd speed rpm : 500

travel mm : 2.30...2.80

3rd speed rpm : 750

travel mm : 4.10...4.30

4th speed rpm : 1500

travel mm : 8.50...8.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1500

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 87.5...89.5

1000 : (85.5...91.5)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control Lever

position degrees: 55...63

Testing:

1st rack travel in: 9.40

Speed rpm : 1340...1350

2nd rack travel in: 4.00

Speed rpm : 1460...1490

4th rack travel in: 1630

Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever

position degrees: 12...20

Testing:

Speed rpm : 100

Minimum rack travel: 8.00

Speed rpm : 300

Rack travel in mm : 6.90...7.10

CONSTANT REGULATION

Speed rpm : 420...550

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 1300

Rack travel in m: 10.40...10.50

2nd speed rpm : 700

Rack travel in m: 10.90...11.00

4th speed rpm : 1000

Rack travel in m: 10.60...10.80

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 700

Rack travel mm : 10.90...11.00

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 9.50...9.70

2nd pressure hPa : 460

Rack travel in m: 10.70...10.80

3rd pressure hPa : 250

Rack travel in m: 9.80...10.00

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm : 700

Del.quantity cm3/ : 86.5...89.5

1000 s: (84.0...92.0)

Aneroid pressure h: 700

Speed rpm : 1000

Del.quantity cm3/ : 90.0...93.0

1000 s: (87.5...95.5)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 60.5...62.5

1000 s: (58.5...64.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.40

Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 100.0...110.0

Rack travel in mm : 13.90...14.10

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 4,0 f
Edition : 15.08.89
Replaces : -
Test oil : ISO-4113
Combination no. : 9 400 085 307
Injection pump
Pump designation : PES4A95D410RS2774
EP type number : 9 400 084 019
Governor
Governor design. : RQV300...1300AB1228-
1L
Governor no. : 9 420 080 268

Customer-spec. information
Customer : DAIMLER-BENZ

Engine : OM 364 A

1st version kW : 85.0
Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 1 417 413 006

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 38...42

Prestroke mm : 3.20...3.30
: (3.15...3.45)

Rack travel in mm : 9.00...12.00
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.60...10.70

Del.quantity cm3/ : 9.0...9.2

100 s: (8.8...9.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.9...7.1

Del.quantity cm3/ : 1.2...1.8

100 s: (1.0...2.0)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
travel mm : 0.80...1.30

2nd speed rpm : 500
travel mm : 2.30...2.80

3rd speed rpm : 750
travel mm : 4.10...4.30

4th speed rpm : 1500
travel mm : 8.50...8.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1500

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 90.0...92.0

1000 : (88.0...94.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 56...64

Testing:

1st rack travel in: 9.60

Speed rpm : 1340...1350

2nd rack travel in: 4.00

Speed rpm : 1470...1500

4th rack travel in: 1640

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 12...20

Testing:

Speed rpm : 100

Minimum rack travel: 8.00

Speed rpm : 300

Rack travel in mm : 6.90...7.10

CONSTANT REGULATION

Speed rpm : 420...550

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 1300

Rack travel in m: 10.60...10.70

2nd speed rpm : 700

Rack travel in m: 11.20...11.30

4th speed rpm : 1000

Rack travel in m: 10.80...11.00

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 700

Rack travel mm : 11.20...11.30

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 9.90...10.10

2nd pressure hPa : 460

Rack travel in m: 11.00...11.10

3rd pressure hPa : 370

Rack travel in m: 10.30...10.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm : 700

Del.quantity cm³/ : 92.0...95.0

1000 s: (89.5...97.5)

Aneroid pressure h: 700

Speed rpm : 1000

Del.quantity cm³/ : 90.5...93.5

1000 s: (88.0...96.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm³/ : 67.0...69.0

1000 s: (65.0...71.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.60

Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm³/ : 100.0...110.0

Rack travel in mm : 13.90...14.10

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 g 1
 Edition : 15.08.89
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 085 308
 Injection pump
 Pump designation : PES6A95D410RS2772
 EP type number : 9 400 084 018
 Governor
 Governor design. : RQV300...1400AB1065-18L
 Governor no. : 9 420 080 278

Customer spec. information
 Customer : DAIMLER-BENZ

Engine : OM 366

1st version kW : 100.0
 Rated speed : 2800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., C : 38...42

Overflow valve : 1 417 413 006

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 9.40...9.50

Del.quantity cm3/ : 6.8...7.0

100 s: (6.6...7.2)

Spread cm3 : 0.3

100 s: (0.3)

2nd speed rpm : 300.0

Rack travel in mm : 7.1...7.3

Del.quantity cm3/ : 0.9...1.5

100 s: (0.7...1.7)

Spread cm3 : 0.3

100 s: (0.3)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
 travel mm : 0.80...1.30

2nd speed rpm : 500
 travel mm : 2.30...2.80

3rd speed rpm : 750
 travel mm : 4.10...4.30

4th speed rpm : 1500
 travel mm : 8.50...8.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1500

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1400

Del.quantity : 68.0...70.0

1000 : (66.0...72.0)

Spread cm3 : 3.50

1000 : (3.50)

RATED SPEED

1st version

Control Lever

position degrees: 55...63

Testing:

1st rack travel in: 8.40

Speed rpm : 1440...1450

2nd rack travel in: 4.00

Speed rpm : 1520...1550

4th rack travel in: 1660

Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever

position degrees: 12...20

Testing:

Speed rpm : 100

Minimum rack travel: 8.50

Speed rpm : 300

Rack travel in mm : 7.10...7.30

CONSTANT REGULATION

Speed rpm : 450...480

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600

Del.quantity cm³/ : 53.5...56.5

1000 s: (51.0...59.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.40

Speed rpm : 1440...1450

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm³/ : 100.0...110.0

Rack travel in mm : 13.70...13.90

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 g 2
 Edition : 15.08.89
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 085 310
 Injection pump
 Pump designation : PES6A95D410RS2772
 EP type number : 9 400 084 018
 Governor
 Governor design. : RQV300...1300AB1066-8L
 Governor no. : 9 420 080 279

Customer-spec. information
 Customer : DAIMLER-BENZ

Engine : OM 366 LA

1st version kW : 155.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., C : 38...42

Overflow valve : 1 417 413 006

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.08)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 11.10...11.20

Del.quantity cm³/ : 9.5...9.7

100 s: (9.3...9.9)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.9...7.1

Del.quantity cm³/ : 1.2...1.8

100 s: (1.0...2.0)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
 travel mm : 0.80...1.30

2nd speed rpm : 500
 travel mm : 2.30...2.80

3rd speed rpm : 750
 travel mm : 4.10...4.30

4th speed rpm : 1500
 travel mm : 8.50...8.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1500

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 95.0...97.0

1000 : (93.0...99.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 55...63

Testing:

1st rack travel in: 10.10
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1470...1500
4th rack travel in: 1640
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 12...20

Testing:

Speed rpm : 100
Minimum rack travel: 8.00
Speed rpm : 300
Rack travel in mm : 6.90...7.10

CONSTANT REGULATION

Speed rpm : 420...550

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : 700
Rack travel mm : 11.10...11.20

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 9.40...9.70

2nd pressure hPa : 450

Rack travel in m: 10.80...10.90

3rd pressure hPa : 250

Rack travel in m: 9.90...10.10

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 700
Del.quantity cm3/ : 90.0...93.0
1000 s: (87.5...95.5)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 60.5...62.5
1000 s: (58.5...64.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.10
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 100.0...110.0

Rack travel in mm : 13.90...14.10

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 b 3
 Edition : 28.09.89
 Replaces : 30.9.88
 Test oil : ISO-4113
 Combination no. : 9 400 230 107
 Injection pump
 Pump designation : PES6A100D320/3RS2691
 -2
 EP type number : 9 410 230 028
 Governor
 Governor design. : RQV350...1200AB1233R
 Governor no. : 9 420 231 018

Customer-spec. information
 Customer : C.D.C

Engine : 6CT830

1st version kW : 157.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 017

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 9 681 271 029

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.80...10.90

Del.quantity cm3/ : 11.3...11.5

100 s: (11.1...11.7)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 4.6...4.8

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 0.00...0.20

2nd speed rpm : 350

travel mm : 1.00...1.50

3rd speed rpm : 450

travel mm : 1.90...2.40

4th speed rpm : 1200

travel mm : 6.90...6.90

5th speed rpm : 1350

travel mm : 8.15...8.65

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1435

Rack travel in mm : 6.70...9.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 700
Del.quantity : 113.0...115.0
1000 : (111.0...117.0)
Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 40...46

Testing:

1st rack travel in: 9.80
Speed rpm : 1240...1250
2nd rack travel in: 4.00
Speed rpm : 1315...1345
4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 9...15
Speed rpm : 350
Rack travel in mm : 4.60...4.80
Rack travel in mm : 2.00
Speed rpm : 480...540

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 240
Rack travel mm : 9.70...9.80

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.30...9.50
2nd pressure hPa : 333
Rack travel in m: 10.20...10.60

START CUT-OUT

Speed 1/min : 290 (300)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 84.5...88.5
1000 s: (82.5...90.5)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.80
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 150.0...170.0
1000 s: (145.0...175.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 4.60...4.80
Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

: C.D.C. # 3908558

Start-of-delivery mark 11, cam angle
after start of delivery cyl. 1

Limit shutoff stop screw to 1.0 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a 7
Edition : 20.12.88
Replaces : 30.9.88
Test oil : ISO-4113

Combination no. : 9 400 230 110

Injection pump
Pump designation : PES6A100D320/3RS2691
-4

EP type number : 9 410 230 030

Governor

Governor design. : RSV450...1100A0C2190
-22R

Governer no. : 9 420 234 173

Customer-spec. information

Customer : C.D.C.

Engine : 6CT830

1st version kW : 150.6

Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp., C : 38...42

Overflow valve
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90
: (2.75...2.95)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Phasing

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.10...12.20

Del.quantity cm3/ : 11.8...12.0

100 s: (11.6...12.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 450.0

Rack travel in mm : 5.7...5.9

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 118.5...120.5

1000 : (116.5...122.5)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 42...50

Testing:
1st rack travel in: 11.10
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1195...1225
4th rack travel in: 1300
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 22...30
Setting point w/out bumper spring
Speed rpm : 450
Rack travel in mm : 5.3

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 450
Rack travel in mm : 5.70...5.90
Rack travel in mm : 2.00
Speed rpm : 500...560

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 12.10...12.20
2nd speed rpm : 750
Rack travel in m: 13.20...13.40

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750
Del.quantity cm³/ : 133.0...137.0
1000 s: (131.0...139.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.10
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...155.0
1000 s: (130.0...160.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 450
Rack travel in mm : 5.70...5.90

Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

: C.D.C. # 3911542
Adjustment without torque-control
spring retainer with 1 mm less
control-rod travel. Increase in
full-load delivery with torque-control
spring retainer.

Start-of-delivery mark 11, cam angle
after start of delivery cyl. 1

Limit shutoff stop screw to 1.0 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a 8
Edition : 20.12.88
Replaces : 30.9.88
Test oil : ISO-4113

Combination no. : 9 400 230 111

Injection pump
Pump designation : PES6A100D320/3RS2691
-4

EP type number : 9 410 230 030

Governor

Governor design. : RSV450...1100AOC2190
-23R

Governer no. : 9 420 234 174

Customer-spec. information

Customer : C.D.C.

Engine : 6CT830

1st version kW : 134.2

Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90
(2.75...2.95)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Phasing

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.20...11.30

Del.quantity cm³/ : 10.1...10.3

100 s: (9.9...10.5)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 450.0

Rack travel in mm : 5.7...5.9

Del.quantity cm³/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 101.0...103.0

1000 : (99.0...105.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 49...57

Testing:

1st rack travel in: 10.20
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1210...1240
3rd rack travel in: 4.00
Speed rpm : 1215...1245
4th rack travel in: 1300
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 31...39
Setting point w/out bumper spring
Speed rpm : 450
Rack travel in mm : 5.3

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 450
Rack travel in mm : 5.70...5.90
Rack travel in mm : 2.00
Speed rpm : 535...595

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 11.20...11.30
2nd speed rpm : 750
Rack travel in m: 12.00...12.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750
Del.quantity cm³/ : 110.5...114.5
1000 s: (108.5...116.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.20
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...155.0
1000 s: (130.0...160.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 450

F02

Rack travel in mm : 5.70...5.90
Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

: C.D.C. # 3911545

Adjustment without torque-control
spring retainer with 0,5 mm less
control-rod travel. Increase in
full-load delivery with torque-control
spring retainer.

Start-of-delivery mark 11, cam angle
after start of delivery cyl. 1

Limit shutoff stop screw to 1.0 mm.

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA 2,2 D
Edition : 09.11.89
replaces : 03.12.86
Calibrating oil : ISO 4113

Injection pump : VE 4/10F2100 L168-1
Type number : 0 460 404 042

Customer-specific information
Customer : MOTORI

Engine : HR 492 HJ

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. , C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : -
(from BDC): -

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000
Charge press. hPa: 800
Setting value mm: 1,8...2,2

Supply-pump pressure:

Speed 1/min: 1000
Charge press. hPa: 800
Setting value bar: 3,1...3,7

Full-load del. with charge press.:

Speed 1/min: 1500
Charge press. hPa: 800
Del.quantity cm3/
1000H.: 60,5...61,5
Dispersion cm3/ : 3,0
1000H.: -

Full-load del. w/out charge press.:

Speed 1/min : 600
Del.quantity cm3/
1000H.: 40,5...41,5

Low-idle speed regulation:

Speed 1/min: 400
Del.quantity cm3/
1000H.: 13,0...17,0
Dispersion cm3/ : 3,0
1000H.: -

Full-load speed regulation:

Speed 1/min: 2300
Charge press. hPa: 800
Del.quantity cm3/
1000H.: 27,0...33,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 37,0

Load-dependent start of delivery:

Speed 1/min: 1500

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
Charge press. hPa: 800
TD travel mm: 1,8...2,2
mm: (1,3...2,7)
2nd speed 1/min: 1500
Charge press. hPa: 800
TD travel mm: 4,4...5,2
mm: (4,1...5,5)
3rd speed 1/min: 2100
Charge press. hPa: 800
TD travel mm: 7,6...8,4
mm: (7,3...8,7)

Supply-pump pressure characteristic:

1st speed 1/min: 600
 Charge press. hPa: 800
 Supply-pump pressure bar: 1,8...2,4
 2nd speed 1/min: 1000
 Charge press. hPa: 800
 Supply-pump pressure bar: 3,1...3,7
 3rd speed 1/min: 2100
 Charge press. hPa: 800
 Supply-pump pressure bar: 6,7...7,5

Overflow quantity at overflow valve:

1st speed 1/min: 600
 Charge press. hPa: 800
 Overflow quantity cm³/10s: 41...83
 2nd speed 1/min: 2100
 Charge press. hPa: 800
 Overflow quantity cm³/10s: 55...138
 3rd speed 1/min: 600
 Charge press. hPa: 800
 Overflow quantity cm³/10s: 40...153

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
 Charge-air pressure-setting point hPa: 400
 LDA stroke mm: 6,1
 Del.quantity cm³/: 52,0...53,0
 1000H.: (50,0...55,0)
 2nd speed 1/min: 2450
 Charge press. hPa: 800
 Del.quantity cm³/: 1,0...9,0
 1000H.: (0,5...9,5)
 3rd speed 1/min: 2300
 Charge press. hPa: 800
 Del.quantity cm³/: 27,0...33,0
 1000H.: (26,0...34,0)
 4th speed 1/min: 2100
 Charge press. hPa: 800
 Del.quantity cm³/: 51,3...54,3
 1000H.: (49,8...55,8)
 5th speed 1/min: 1500
 Charge press. hPa: 800
 Del.quantity cm³/: 60,5...61,5
 1000H.: (59,0...63,0)
 6th speed 1/min: 700
 Charge press. hPa: 800
 Del.quantity cm³/: 52,0...53,0
 1000H.: (50,0...55,0)
 7th speed 1/min: 600
 Charge press. hPa: 800
 Del.quantity cm³/: 63,0...66,0
 1000H.: (61,5...67,5)
 8th speed 1/min: 600
 Charge press. hPa: -

Del.quantity cm³/: 40,5...41,5
 1000H.: (38,5...43,5)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 400
 ELAB volt: -
 Del.quantity cm³/: 0,0...3,0
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 400
 Del.quantity cm³/: 13,0...17,
 1000H.: (10,0...20,0)
 2nd speed 1/min: 450
 Del.quantity cm³/: 2,5...8,5
 1000H.: (0,5...10,5)
 3rd speed 1/min: 600
 Del.quantity cm³/: 0,0...2,0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 400
 Del.quantity cm³/: -
 ind. 1000H.: 45,0
 2nd speed 1/min: 500
 Del.quantity cm³/: -
 max. 1000H.: 55,0

Shutoff electromagnet:

Cut-in min. voltage : 10,0
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,2...5,5
MS	mm	: 0,7...0,9
XK	mm	: 17,0...19,0
XL	mm	: 8,6...12,0

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA 2,2 F1
Edition : 15.11.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/10F2100 L269-1
Type number : 0 460 404 065

Customer-specific information
Customer : MOTORI VM

Engine : HR 492.4 HJ

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. , C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : -
(from BDC): -

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000
Charge press. hPa: 1000
Setting value mm: 1,5...1,9

Supply-pump pressure:

Speed 1/min: 1000
Charge press. hPa: 1000
Setting value bar: 4,4...5,0

Full-load del. with charge press.:

Speed 1/min: 1500
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 66,0...67,0
Dispersion cm3/ : 3,0
1000H : -

Full-load del. w/out charge press.:

Speed 1/min : 700
Del.quantity cm3/
1000H.: 45,0...46,0

Low-idle speed regulation:

Speed 1/min: 450
Del.quantity cm3/
1000H.: 13,0...17,0

Full-load speed regulation:

Speed 1/min: 2300
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 27,0...33,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 45,0

Load-dependent start of delivery:

Speed 1/min: 1500
Charge press. hPa: -

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
Charge press. hPa: 1000
TD travel mm: 1,5...1,9
mm: (1,0...2,4)
2nd speed 1/min: 1500
Charge press. hPa: 1000
TD travel mm: 4,1...4,9
mm: (3,8...5,2)
3rd speed 1/min: 2100
Charge press. hPa: 1000
TD travel mm: 7,1...7,9
mm: (6,8...8,2)

Supply-pump pressure characteristic:

1st speed 1/min: 700
 Charge press. hPa: 1000
 Supply-pump pressure bar: 3,2...3,8
 2nd speed 1/min: 1000
 Charge press. hPa: 1000
 Supply-pump pressure bar: 4,4...5,0
 3rd speed 1/min: 2100
 Charge press. hPa: 1000
 Supply-pump pressure bar: 7,5...8,1

Overflow quantity at overflow valve:

1st speed 1/min: 700
 Charge press. hPa: 1000
 Overflow : 41...83
 quantity cm³/10s: (26...98)
 2nd speed 1/min: 2100
 Charge press. hPa: 1000
 Overflow : 55...138
 quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
 Charge-air pressure-setting point hPa: 450
 Del.quantity cm³/: 58,5...59,5
 1000H.: (56,5...61,5)
 2nd speed 1/min: 2450
 Charge press. hPa: 1000
 Del.quantity cm³/: 0,0...8,0
 1000H.: -
 3rd speed 1/min: 2300
 Charge press. hPa: 1000
 Del.quantity cm³/: 27,0...33,0
 1000H.: (26,0...34,0)
 4th speed 1/min: 2100
 Charge press. hPa: 1000
 Del.quantity cm³/: 57,5...58,5
 1000H.: (55,0...61,0)
 5th speed 1/min: 1500
 Charge press. hPa: 1000
 Del.quantity cm³/: 66,0...67,0
 1000H.: (64,5...68,5)
 6th speed 1/min: 700
 Charge press. hPa: 450
 Del.quantity cm³/: 58,5...59,5
 1000H.: (56,5...61,5)
 7th speed 1/min: 700
 Charge press. hPa: 1000
 Del.quantity cm³/: 67,7...70,7
 1000H.: (66,2...72,2)
 8th speed 1/min: 700
 Charge press. hPa: -
 Del.quantity cm³/: 45,0...46,0
 1000H.: (43,0...48,0)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 450
 ELAB volt: -
 Del.quantity cm³/: 0,0...3,0
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 450
 Del.quantity cm³/: 13,0...17,0
 1000H.: (10,0...20,0)
 2nd speed 1/min: 475
 Del.quantity cm³/: 7,0...13,0
 1000H.: (5,0...15,0)
 3rd speed 1/min: 550
 Del.quantity cm³/: 0,5...5,5
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 400
 Del.quantity cm³/: -
 ind. 1000H: 50,0
 2nd speed 1/min: 550
 Del.quantity cm³/: -
 max. 1000H: 60,0

Shutoff electromagnet:

Cut-in
 min. voltage : 10,0
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,6...6,0
MS	mm	: 0,6...1,0
XK	mm	: 20,0...22,0
XL	mm	: 10,0...13,4

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA 2,2 M
Edition : 07.11.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/10F1600 L379
Type number : 0 460 404 067

Customer-specific information
Customer : VM

Engine : HR 494 HT

Power k: 68

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : -
(from BDC): -

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1200
Charge press. hPa: 1000
Setting value mm: 2,1...2,5

Supply-pump pressure:

Speed 1/min: 1200
Charge press. hPa: 1000

Setting value bar: 4,8...5,4

Full-load del. with charge press.:

Speed 1/min: 1200
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 61,0...62,0
Dispersion cm3/ : 3,5
1000H : (4,0)

Full-load del. w/out charge press.:

Speed 1/min : 600
Del.quantity cm3/
1000H.: 52,0...53,0

Low-idle speed regulation:

Speed 1/min: 400
Charge press. hPa: -
Del.quantity cm3/
1000H.: 11,0...15,0
Dispersion cm3/ : 3,5
1000H.: -

Full-load speed regulation:

Speed 1/min: 1700
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 32,0...38,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 60,0

Load-dependent start of delivery:

Speed 1/min: 1200
Charge press. hPa: 1000

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
Charge press. hPa: 1000
TD travel mm: 1,0...1,8
mm: (0,7...2,1)

2nd speed 1/min: 1200
Charge press. hPa: 1000
TD travel mm: 2,1...2,5
mm: (1,6...3,0)

3rd speed 1/min: 1600
Charge press. hPa: 1000

TD travel mm: 3,9...4,7
mm: (3,6...5,0)

Supply-pump pressure characteristic:

1st speed 1/min: 750
Charge press. hPa: 1000
Supply-pump pressure bar: 3,0...3,6
2nd speed 1/min: 1200
Charge press. hPa: 1000
Supply-pump pressure bar: 4,8...5,4
3rd speed 1/min: 1600
Charge press. hPa: 1000
Supply-pump pressure bar: 6,4...7,0

Overflow quantity at overflow valve:

1st speed 1/min: 750
Charge press. hPa: 1000
Overflow quantity cm³/10s: (41...83)
2nd speed 1/min: 1600
Charge press. hPa: 1000
Overflow quantity cm³/10s: (55...138)
3rd speed 1/min: 1600
Charge press. hPa: 1000
Overflow quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 750
Charge-air pressure-setting point hPa: 200
LDA stroke mm: -
Del.quantity cm³/: 58,0...59,0
1000H.: (55,5...61,5)
2nd speed 1/min: 1730
Charge press. hPa: 1000
Del.quantity cm³/: 0,0...3,0
1000H.: -
3rd speed 1/min: 1700
Charge press. hPa: 1000
Del.quantity cm³/: 32,0...38,0
1000H.: (29,0...41,0)
4th speed 1/min: 1600
Charge press. hPa: 1000
Del.quantity cm³/: 53,5...56,5
1000H.: (52,0...58,0)
5th speed 1/min: 1200
Charge press. hPa: 1000
Del.quantity cm³/: 61,0...62,0
1000H.: (58,5...64,5)
6th speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/: 60,0...63,0
1000H.: (58,5...64,5)
7th speed 1/min: 750
Charge press. hPa: 200

Del.quantity cm³/: 61,0...62,0
1000H.: (55,5...61,5)
8th speed 1/min: 600
Charge press. hPa: -
Del.quantity cm³/: 52,0...53,0
1000H.: (49,5...55,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1600
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 400
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 400
Del.quantity cm³/: 11,0...15,0
1000H.: (8,5...18,5)
2nd speed 1/min: 480
Del.quantity cm³/: 2,0...8,0
1000H.: (1,0...9,0)
3rd speed 1/min: 550
Del.quantity cm³/: 0,0...3,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 250
Del.quantity cm³/: -
ind. 1000H: 58,0

2nd speed 1/min: 450
Del.quantity cm³/: -
max. 1000H : 66,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K mm : 3,2...3,4
KF mm : 5,6...6,0
MS mm : 0,6...1,0

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : ONA 3,4 A
Edition : 03.11.89
replaces : 22.04.88
Calibrating oil : ISO 4113

Injection pump : VE 6/10F1800 R209
Type number : 0 460 406 048

Customer-specific information
Customer : ONAN

Engine : L634T

TEST BENCH REQUIREMENTS

Calibrating-oil:
return temp. $^{\circ}\text{C}$:
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,2
(from BDC): $\pm 0,02(0,04)$

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1400
Charge press. hPa: 800
Setting value mm: 3,9...4,3

Supply-pump pressure:

Speed 1/min: 1400
Charge press. hPa: 800
Setting value bar: 4,8...5,4

Full-load del. with charge press.:

Speed 1/min: 1400
Charge press. hPa: 800
Del.quantity cm³/
1000H.: 58,5...59,5
Dispersion cm³/
1000H.: 3,0
(4,0)

Full-load del. w/out charge press.:

Speed 1/min : 700
Del.quantity cm³/
1000H.: 44,0...45,0

Low-idle speed regulation:

Speed 1/min: 400
Del.quantity cm³/
1000H.: 14,0...18,0
Dispersion cm³/
1000H.: -

Full-load speed regulation:

Speed 1/min: 1900
Charge press. hPa: 800
Del.quantity cm³/
1000H.: 37,0...43,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 42,0

Load-dependent start of delivery:

Speed 1/min: 1400
Charge press. hPa: 800

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
Charge press. hPa: 800
TD travel mm: 1,0...1,8
(0,7...2,1)
2nd speed 1/min: 1400
Charge press. hPa: 800
TD travel mm: 3,9...4,3
(3,4...4,8)
3rd speed 1/min: 1800
Charge press. hPa: 800
TD travel mm: 5,4...6,2
(5,1...6,5)

Supply-pump pressure characteristic:

1st speed 1/min: 800
Charge press. hPa: 800
Supply-pump pressure bar: 2,7...3,3
2nd speed 1/min: 1400
Charge press. hPa: 800
Supply-pump pressure bar: 4,8...5,4
3rd speed 1/min: 1800
Supply-pump pressure bar: 6,0...6,6

Overflow quantity at overflow valve:

1st speed 1/min: 700
Charge press. hPa: 800
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1800
Charge press. hPa: 800
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting point hPa: 300
LDA stroke mm: 5,1
Del.quantity cm³/: 44,0...45,0
1000H.: (42,2...46,8)
2nd speed 1/min: 2050
Charge press. hPa: 800
Del.quantity cm³/: 0,0...3,0
1000H.: -
3rd speed 1/min: 2000
Charge press. hPa: 800
Del.quantity cm³/: 5,5...14,5
1000H.: -
4th speed 1/min: 1950
Charge press. hPa: 800
Del.quantity cm³/: 23,0...31,0
1000H.: (22,0...32,0)
5th speed 1/min: 1900
Charge press. hPa: 800
Del.quantity cm³/: 37,0...43,0
1000H.: (36,0...44,0)
6th speed 1/min: 1800
Charge press. hPa: 800
Del.quantity cm³/: 51,5...54,5
1000H.: (50,7...55,3)
7th speed 1/min: 1400
Charge press. hPa: 800
Del.quantity cm³/: 58,5...59,5
1000H.: (56,7...61,3)
8th speed 1/min: 700
Charge press. hPa: 800

Del.quantity cm³/: 58,0...61,0
1000H.: -
9th speed 1/min: 700
Charge press. hPa: 300
Del.quantity cm³/: 50,5...51,5
1000H.: (48,7...53,3)
10th speed 1/min: 700
Charge press. hPa: -
Del.quantity cm³/: 44,0...45,0
1000H.: (42,2...46,8)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1800
Del.quantity cm³/: 0...3
1000H.: -

Electr. shutoff:

Speed 1/min: 350
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 400
Del.quantity cm³/: 14,0...18,0
1000H.: (12,0...20,0)
2nd speed 1/min: 450
Del.quantity cm³/: 0,0...6,0
1000H.: -
3rd speed 1/min: 350
Del.quantity cm³/: 26,5...33,5
1000H.: (26,0...34,0)

Automatic starting fuel delivery:

1st speed 1/min: 220
Del.quantity cm³/: -
ind. 1000H: 42,0
2nd speed 1/min: 300
Del.quantity cm³/: -
max. 1000H : 42,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K mm : -
KF mm : 5,6...6,0
MS mm : 0,6...1,0

SVS max. mm : 1,7
XK mm : 20,0...22,0
XL mm : 10,1...13,5

Remarks:

Operate control lever after each
manifold-pressure compensator pressure
change.

* Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : ONA 3,4C
Edition : 03.11.89
replaces : 13.07.88
Calibrating oil : ISO 4113

Injection pump : VE 6/10F 1500R 209-2
Type number : 0 460 406 060
Customer Part-No. :

Customer-specific information
Customer : ONAN

Engine : L634TA HD

TEST BENCH REQUIREMENTS

Calibrating oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,2
(from BDC): +0,02(0,04)

Indicator setting:
Piston stroke mm : 1.0
Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1400
Charge press. hPa: 800
Setting value mm: 4,3...4,7

Supply-pump pressure:

Speed 1/min: 1400
Charge press. hPa: 800
Setting value bar: 4,8...5,4

Full-load del. with charge press.:

Speed 1/min: 1100
Charge press. hPa: 800
Del. quantity cm³/
1000H.: 55,5...56,5
Dispersion cm³/
1000H : (3,0)

Full-load del. w/out charge press.:

Speed 1/min : 700
Del. quantity cm³/
1000H.: 42,5...43,5

Low-idle speed regulation:

Speed 1/min: 400
Del. quantity cm³/
1000H.: 14,0...18,0
Dispersion cm³/
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 1640
Charge press. hPa: 800
Del. quantity cm³/
1000H: 20,0...24,0

Start:

Speed 1/min: 100
Del. quantity : -
mind cm³/1000H.: 42,0

Load-dependent start of delivery:

Speed 1/min: 1100
Charge press. hPa: 800

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
Charge press. hPa: 800
TD travel mm: 1,4...2,2
mm: (1,1...2,5)
2nd speed 1/min: 1100
Charge press. hPa: 800

TD travel mm: 2,7...3,3
mm: (2,3...3,7)
3rd speed 1/min: 1400
Charge press. hPa: 800
TD travel mm: 4,3...4,7
mm: (3,8...5,2)

Supply-pump pressure characteristic:

1st speed 1/min: 700
Charge press. hPa: 800
Supply-pump pressure bar: 2,3...2,9
2nd speed 1/min: 1100
Charge press. hPa: 800
Supply-pump pressure bar: 3,8...4,4
3rd speed 1/min: 1400
Charge press. hPa: 800
Supply-pump pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 700
Charge press. hPa: 800
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1500
Charge press. hPa: 800
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting point hPa: 350
LDA stroke mm: 6,5
Del.quantity cm³/: 48,0...48,5
1000H.: (46,2...50,8)
2nd speed 1/min: 1740
Charge press. hPa: 800
Del.quantity cm³/: 0,0...6,0
1000H.: -
3rd speed 1/min: 1640
Charge press. hPa: 800
Del.quantity cm³/: 20,0...24,0
1000H.: (18,0...26,0)
4th speed 1/min: 1580
Charge press. hPa: 800
Del.quantity cm³/: 43,0...51,0
1000H.: -
5th speed 1/min: 1500
Charge press. hPa: 800
Del.quantity cm³/: 52,5...55,5
1000H.: (51,7...56,3)
6th speed 1/min: 1400
Charge press. hPa: 800

Del.quantity cm³/: 55,5...56,5
1000H.: (53,7...58,3)
7th speed 1/min: 700
Charge press. hPa: 800
Del.quantity cm³/: 55,5...58,5
1000H.: -
8th speed 1/min: 700
Charge press. hPa: 350
Del.quantity cm³/: 48,0...49,0
1000H.: (46,2...50,8)
9th speed 1/min: 700
Charge press. hPa: -
Del.quantity cm³/: 42,5...43,5
1000H.: (40,7...45,3)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1500
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 350
ELAB volt: -
Del.quantity cm³/: 0,0 3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 400
Del.quantity cm³/: 14,0...18,0
1000H.: (12,0...20,0)
2nd speed 1/min: 450
Del.quantity cm³/: 0,0...6,0
3rd speed 1/min: 350
Del.quantity cm³/: 26,5...33,5
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 220
Del.quantity cm³/: -
ind. 1000H: 42,0
2nd speed 1/min: 300
Del.quantity cm³/: -
max. 1000H: 42,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,6...6,0
MS	mm	: 0,6...1,0
SVS max.	mm	: 2,1

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 3,1 A1
Edition : 03.11.89
replaces : 04.12.86
Calibrating oil : ISO 4113

Injection pump : VE 4/11F1625 L217-2
Type number : D 460 414 031

Customer-specific information
Customer : VOLVO PENTA

Engine : TAM 31

Power k: 81

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02(0,04)

Injection pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Charge press. hPa: 1000
Setting value mm: 4,3...4,7

Supply-pump pressure:

Speed 1/min: 1500
Charge press. hPa: 1000

Setting value bar: 6,1...6,7

Full-load del. with charge press.:

Speed 1/min: 1500
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 83,5...84,5
Dispersion cm³/
1000H.: 5,0

Full-load del. w/out charge press.:

Speed 1/min : 650
Del.quantity cm³/
1000H.: 51,0...52,0

Low-idle speed regulation:

Speed 1/min: 350
Del.quantity cm³/
1000H.: 23,0...27,0
Dispersion cm³/
1000H.: 3,5

Full-load speed regulation:

Speed 1/min: 1800
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 31,0...37,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 95,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: 0,9...1,7
mm: (0,6...2,0)
2nd speed 1/min: 1500
Charge press. hPa: 1000
TD travel mm: 4,3...4,7
mm: (3,8...5,2)
3rd speed 1/min: 1625
Charge press. hPa: 1000
TD travel mm: 5,0...5,8
mm: (4,7...6,1)

Supply-pump pressure characteristic:

1st speed 1/min: 800

Charge press. hPa: 1000
 Supply-pump pressure bar: 3,4...4,0
 2nd speed 1/min: 1500
 Charge press. hPa: 1000
 Supply-pump pressure bar: 6,1...6,7
 3rd speed 1/min: 1625
 Charge press. hPa: 1000
 Supply-pump pressure bar: 6,6...7,2

Overflow quantity at overflow valve:

1st speed 1/min: 800
 Charge press. hPa: 1000
 Overflow : 41...83
 quantity cm³/10s: (26...98)
 2nd speed 1/min: 1625
 Charge press. hPa: 1000
 Overflow : 55...138
 quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800
 Charge-air pressure-setting point hPa: 300
 LDA stroke mm: 6,4
 Del.quantity cm³/: 65,0...66,0
 1000H.: (63,2...67,8)
 2nd speed 1/min: 1970
 Charge press. hPa: 1000
 Del.quantity cm³/: 0,0...3,0
 1000H.: -
 3rd speed 1/min: 1880
 Charge press. hPa: 1000
 Del.quantity cm³/: 3,0...11,0
 1000H.: (2,0...12,0)
 4th speed 1/min: 1750
 Charge press. hPa: 1000
 Del.quantity cm³/: 53,0...61,0
 1000H.: -
 5th speed 1/min: 1800
 Charge press. hPa: 1000
 Del.quantity cm³/: 31,0...37,0
 1000H.: (30,0...38,0)
 6th speed 1/min: 1625
 Charge press. hPa: 1000
 Del.quantity cm³/: 78,5...81,5
 1000H.: (77,0...83,0)
 7th speed 1/min: 1500
 Charge press. hPa: 1000
 Del.quantity cm³/: 83,5...84,5
 1000H.: (81,7...86,3)
 8th speed 1/min: 1000
 Charge press. hPa: 1000
 Del.quantity cm³/: 91,7...94,3
 1000H.: (90,7...95,3)
 9th speed 1/min: 800

Charge press. hPa: 1000
 Del.quantity cm³/: 90,0...93,0
 1000H.: (88,5...94,5)
 10th speed 1/min: 800
 Charge press. hPa: 300
 Del.quantity cm³/: 65,0...66,0
 1000H.: (63,2...67,8)
 11th speed 1/min: 650
 Charge press. hPa: -
 Del.quantity cm³/: 51,0...52,0
 1000H.: (49,2...53,8)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 350
 ELAB volt: 12,0
 Del.quantity cm³/: 0,0...3,0
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 350
 Del.quantity cm³/: 23,0...27,0
 1000H.: (20,0...30,0)
 2nd speed 1/min: 400
 Del.quantity cm³/: 7,0...13,0
 1000H.: (5,5...14,5)
 3rd speed 1/min: 460
 Del.quantity cm³/: 0,0...3,0
 1000H.: -

Shutoff electromagnet:

Cut-in
 min. voltage : 10,0
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: K-OT
MS	mm	: 1,2...1,45
SVS max.	mm	: 1,2
XK	mm	: 18,8...20,8
XL	mm	: 11,1...14,5

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 3,1 A2
Edition : 03.11.89
replaces : 04.12.86
Calibrating oil : ISO 4113

Injection pump : VE 4/11F1625 L217-4
Type number : 0 460 414 034

Customer-specific information
Customer : VOLVO PENTA

Engine : TAM 31

Power k: 81

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02(0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Charge press. hPa: 1000
Setting value mm: 4,3...4,7

Supply-pump pressure:

Speed 1/min: 1500
Charge press. hPa: 1000

F17

Setting value bar: 6,1...6,7

Full-load del. with charge press.:

Speed 1/min: 1500
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 83,5...84,5
Dispersion cm3/ : 5,0
1000H : -

Full-load del. w/out charge press.:

Speed 1/min : 650
Del.quantity cm3/
1000H.: 51,0...52,0

Low-idle speed regulation:

Speed 1/min: 350
Del.quantity cm3/
1000H.: 23,0...27,0
Dispersion cm3/ : 3,5
1000H.: -

Full-load speed regulation:

Speed 1/min: 1800
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 31,0...37,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 95,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: 0,9...1,7
mm: (0,6...2,0)
2nd speed 1/min: 1500
Charge press. hPa: 1000
TD travel mm: 4,3...4,7
mm: (3,8...5,2)
3rd speed 1/min: 1625
Charge press. hPa: 1000
TD travel mm: 5,0...5,8
mm: (4,7...6,1)

Supply-pump pressure characteristic:

1st speed 1/min: 800

Charge press. hPa: 1000
 Supply-pump
 pressure bar: 3,4...4,0
 2nd speed 1/min: 1500
 Charge press. hPa: 1000
 Supply-pump
 pressure bar: 6,1...6,7
 3rd speed 1/min: 1625
 Charge press. hPa: 1000
 Supply-pump
 pressure bar: 6,6...7,2

Overflow quantity at overflow valve:

1st speed 1/min: 800
 Charge press. hPa: 1000
 Overflow : 41...83
 quantity cm³/10s: (26...98)
 2nd speed 1/min: 1625
 Charge press. hPa: 1000
 Overflow : 55...138
 quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800
 Charge-air pressure-setting
 point hPa: 300
 LDA stroke mm: 6,4
 Del.quantity cm³/: 65,0...66,0
 1000H.: (63,2...67,8)
 2nd speed 1/min: 1970
 Charge press. hPa: 1000
 Del.quantity cm³/: 0,0...3,0
 1000H.: -
 3rd speed 1/min: 1880
 Charge press. hPa: 1000
 Del.quantity cm³/: 3,0...11,0
 1000H.: (2,0...12,0)
 4th speed 1/min: 1750
 Charge press. hPa: 1000
 Del.quantity cm³/: 53,0...61,0
 1000H.: -
 5th speed 1/min: 1800
 Charge press. hPa: 1000
 Del.quantity cm³/: 31,0...37,0
 1000H.: (30,0...38,0)
 6th speed 1/min: 1625
 Charge press. hPa: 1000
 Del.quantity cm³/: 78,5...81,5
 1000H.: (77,0...83,0)
 7th speed 1/min: 1500
 Charge press. hPa: 1000
 Del.quantity cm³/: 83,5...84,5
 1000H.: (81,7...86,3)
 8th speed 1/min: 1000
 Charge press. hPa: 1000
 Del.quantity cm³/: 91,7...94,3
 1000H.: (90,7...95,3)
 9th speed 1/min: 800

Charge press. hPa: 1000
 Del.quantity cm³/: 90,0...93,0
 1000H.: (88,5...94,5)
 10th speed 1/min: 800
 Charge press. hPa: 300
 Del.quantity cm³/: 65,0...66,0
 1000H.: (63,2...67,8)
 11th speed 1/min: 650
 Charge press. hPa: -
 Del.quantity cm³/: 51,0...52,0
 1000H.: (49,2...53,8)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 350
 ELAB volt: 24,0
 Del.quantity cm³/: 0,0...3,0
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 350
 Del.quantity cm³/: 23,0...27,0
 1000H.: (20,0...30,0)
 2nd speed 1/min: 400
 Del.quantity cm³/: 7,0...13,0
 1000H.: (5,5...14,5)
 3rd speed 1/min: 460
 Del.quantity cm³/: 0,0...3,0
 1000H.: -

Shutoff electromagnet:

Cut-in
 min. voltage : 20,0
 Rated voltage : 24,0

Mounting and assembly dimensions:

Designation
 K mm : -
 KF mm : K-0T
 MS mm : 1,2...1,45
 SVS max. mm : 1,2
 XK mm : 18,8...20,8
 XL mm : 11,1...14,5

Remarks:

Operate control lever after each
 manifold-pressure compensator pressure
 change.

* Correction at adjusting nut (46)

Pushing electromagnet.

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SOF 2,5K2
Edition : 02.11.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/11F1900 R127-2
Type number : 0 460 414 038

Customer-specific information
Customer : IVECO SOFIM

Engine : 8140.21.215

TEST BENCH REQUIREMENTS

Calibrating oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 023

Opening
pressure bar : 172...175

Perforated plate
diameter mm : 0.4

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02(0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 4,6...5,0

Supply-pump pressure:

Speed 1/min: 1100

F20

Charge press. hPa: 1000
Setting value bar: 5,1...5,7

Full-load del. with charge press.:

Speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 44,7...45,7
Dispersion cm3/ : 3,5
1000H : -

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 38,5...39,5

Low-idle speed regulation:

Speed 1/min: 400
Charge press. hPa: -
Del.quantity cm3/
1000H.: 13,0...17,0

Full-load speed regulation:

Speed 1/min: 2300
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 15,0...21,0

Start:

Speed 1/min: 100
Charge press. hPa: -
Del.quantity : -
mind cm3/1000H.: 60,0

Load-dependent start of delivery:

Speed 1/min: 1100
Charge press. hPa: -

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
Charge press. hPa: 1000
TD travel mm: 2,8...3,6
mm: (2,5...3,9)

2nd speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: 4,6...5,0
mm: (4,1...5,5)

3rd speed 1/min: 1500
Charge press. hPa: 1000

TD travel mm: 6,1...6,9
 (5,8...7,2)
 4th speed 1/min: 1900
 Charge press. hPa: 1000
 TD travel mm: 7,6...8,4
 (7,3...8,7)

Supply-pump pressure characteristic:

1st speed 1/min: 500
 Charge press. hPa: 1000
 Supply-pump pressure bar: 3,3...3,9
 2nd speed 1/min: 1100
 Charge press. hPa: 1000
 Supply-pump pressure bar: 5,1...5,7
 3rd speed 1/min: 1900
 Charge press. hPa: 1000
 Supply-pump pressure bar: 7,2...7,8

Overflow quantity at overflow valve:

1st speed 1/min: 500
 Charge press. hPa: -
 Overflow : 41...83
 quantity cm³/10s: (26...98)
 2nd speed 1/min: 1900
 Charge press. hPa: 1000
 Overflow : 55...138
 quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 900
 Charge-air pressure-setting point hPa: 400
 LDA stroke mm: 6,2
 Del.quantity cm³/: 37,5...38,5
 1000H.: (35,4...40,6)
 2nd speed 1/min: 2450
 Charge press. hPa: 1000
 Del.quantity cm³/: 0,0...5,0
 1000H.: -
 3rd speed 1/min: 2300
 Charge press. hPa: 1000
 Del.quantity cm³/: 15,0...21,0
 1000H.: (13,5...22,5)
 4th speed 1/min: 2100
 Charge press. hPa: 1000
 Del.quantity cm³/: 30,0...38,0
 1000H.: (29,5...38,5)
 5th speed 1/min: 1900
 Charge press. hPa: 1000
 Del.quantity cm³/: 41,6...44,0
 1000H.: (40,2...45,4)
 6th speed 1/min: 1500
 Charge press. hPa: 1000

Del.quantity cm³/: 42,3...44,7
 1000H.: (40,9...46,1)
 7th speed 1/min: 1100
 Charge press. hPa: 1000
 Del.quantity cm³/: 44,7...45,7
 1000H.: (42,6...47,8)
 8th speed 1/min: 900
 Charge press. hPa: 400
 Del.quantity cm³/: 37,5...38,5
 1000H.: (35,4...40,6)
 9th speed 1/min: 500
 Charge press. hPa: 1000
 Del.quantity cm³/: 50,8...54,2
 1000H.: (49,1...55,9)
 10th speed 1/min: 500
 Charge press. hPa: -
 Del.quantity cm³/: 38,5...39,5
 1000H.: (36,4...41,6)

Zero delivery (stop):

Idle delivery:

1st speed 1/min: 400
 Del.quantity cm³/: 13,0...17,0
 1000H.: 10,5...19,5
 2nd speed 1/min: 350
 Del.quantity cm³/: 27,0...33,0
 1000H.: (25,5...34,5)
 3rd speed 1/min: 550
 Del.quantity cm³/: 0,0...5,0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 200
 Charge press. hPa: -
 Del.quantity cm³/: -
 ind. 1000H.: 70,0
 2nd speed 1/min: 350
 Charge press. hPa: -
 Del.quantity cm³/: -
 max. 1000H.: 70,0

Shutoff electromagnet:

Cut-in
 min. voltage : 10,0
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
 K mm : -
 KF mm : K-OT
 MS mm : 0,8...1,2
 SVS max. mm : 1,5

Remarks:



BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR 2,5 B
Edition : 07.11.89
replaces : 12.05.89
Calibrating oil : ISO 4113

Injection pump : VE 4/11F2000 R288
Type number : 0 460 414 051

Customer-specific information
Customer : FORD

Engine : 2,5 DI

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 023

Opening
pressure bar : 172...175

Perforated-plate
diameter mm : 0.4

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : -
(from BDC): -

Start of delivery block
Piston stroke mm: 0,78
mm: 0,73...0,83
Outlet : B

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250
Setting value mm: 2,5...2,9

Supply-pump pressure:

Speed 1/min: 1250
Setting value bar: 5,6...6,2

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 30,5...31,5 F

Low-idle speed regulation:

Speed 1/min: 425
Del.quantity cm3/
1000H.: 16,0...20,0

Full-load speed regulation:

Speed 1/min: 2100
Del.quantity cm3/
1000H: 30,5...34,5

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 62,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
TD travel mm: 0,0...0,8
mm: (0,0...1,1)
2nd speed 1/min: 1250
TD travel mm: 2,5...2,9
mm: (2,2...3,2)
3rd speed 1/min: 1950
TD travel mm: 6,0...6,8
mm: (5,7...7,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 3,1...3,7
2nd speed 1/min: 1000
Supply-pump
pressure bar: 4,8...5,4
3rd speed 1/min: 1250
Supply-pump
pressure bar: 5,6...6,2
4th speed 1/min: 1950
Supply-pump
pressure bar: 7,7...8,3

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 55...100
quantity cm³/10s: (40...115)
2nd speed 1/min: 1950
Overflow : 83...153
quantity cm³/10s: (68...168)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1950
HBA stroke mm: 10,0
Del.quantity cm³/: 37,0...40,6 D
1000H.: (36,3...41,3) D
2nd speed 1/min: 2400
Del.quantity cm³/: 0,0...10,0
1000H.: -
3rd speed 1/min: 2200
Del.quantity cm³/: 18,0...26,0
1000H.: (16,0...28,0)
4th speed 1/min: 2100
Del.quantity cm³/: 30,5...34,5
1000H.: (27,5...37,5)
5th speed 1/min: 1950
Del.quantity cm³/: 37,0...40,6
1000H.: (36,3...41,3)
6th speed 1/min: 1700
Del.quantity cm³/: 37,7...41,3
1000H.: (37,0...42,0)
7th speed 1/min: 1000
Del.quantity cm³/: 35,5...36,5 E
1000H.: (33,5...38,5) E
8th speed 1/min: 500
Del.quantity cm³/: 30,5...31,5 F
1000H.: (26,0...36,0) F

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 425
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 425
Del.quantity cm³/: 16,0...20,0
1000H.: (14,0...22,0)
2nd speed 1/min: 500
Del.quantity cm³/: 9,5...17,5
1000H.: (7,5...19,5)

Automatic starting fuel delivery:

1st speed 1/min: 300

Del.quantity cm³/: -
ind. 1000H: 30,0

2nd speed 1/min: 480
Del.quantity cm³/: -
max. 1000H: 34,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : 3,2...3,4
KF mm : K-0T
MS mm : 1,3...1,7
SVS max. mm : 3,8
XK mm : 17,0...19,0
XL mm : 10,9...14,5

Remarks:

Pump/engine assignment:
Stroke in blocking position 0.73...
0.83 mm, referenced to outlet "B".
Attach timing-device cover
KDEP 1151.

F = Adjustment point for low full-load
delivery
E = Fuel-delivery adjustment point in
HBA range. (Correction by way of HBA
adjusting screw).
D = Adjustment point for high full-
load delivery

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR 2,5 C
Edition : 07.11.89
replaces : 12.05.89
Calibrating oil : ISO 4113

Injection pump : VE 4/11F2000 R288-1
Type number : 0 460 414 052

Customer-specific information
Customer : FORD

Engine : 2,5 DI

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 023

Opening
pressure bar : 172...175

Perforated-plate
diameter mm : 0.4

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : -
(from BDC): -

Start of delivery block
Piston stroke mm : 0,78
mm : 0,73...0,83

Outlet : B

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250
Setting value mm : 2,5...2,9

Supply-pump pressure:

Speed 1/min: 1250
Setting value bar: 5,6...6,2

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 30,5...31,5 F

Low-idle speed regulation:

Speed 1/min: 425
Del.quantity cm3/
1000H.: 16,0...20,0

Full-load speed regulation:

Speed 1/min: 2100
Del.quantity cm3/
1000H: 30,5...34,5

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 62,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
TD travel mm : 0,0...0,8
mm : (0,0...1,1)
2nd speed 1/min: 1250
TD travel mm : 2,5...2,9
mm : (2,2...3,2)
3rd speed 1/min: 1950
TD travel mm : 6,0...6,8
mm : (5,7...7,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 3,1...3,7
2nd speed 1/min: 1000
Supply-pump
pressure bar: 4,8...5,4
3rd speed 1/min: 1250
Supply-pump
pressure bar: 5,6...6,2
4th speed 1/min: 1950
Supply-pump
pressure bar: 7,7...8,3

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 55...100
quantity cm3/10s: (40...115)
2nd speed 1/min: 1950
Overflow : 83...153
quantity cm3/10s: (68...168)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1950
HBA stroke mm: 10,0
Del.quantity cm3/: 37,0...40,6 D
1000H.: (36,3...41,3) D
2nd speed 1/min: 2400
Del.quantity cm3/: 0,0...10,0
1000H.: -
3rd speed 1/min: 2200
Del.quantity cm3/: 18,0...26,0
1000H.: (16,0...28,0)
4th speed 1/min: 2100
Del.quantity cm3/: 30,5...34,5
1000H.: (27,5...37,5)
5th speed 1/min: 1950
Del.quantity cm3/: 37,0...40,6
1000H.: (36,3...41,3)
6th speed 1/min: 1700
Del.quantity cm3/: 37,7...41,3
1000H.: (37,0...42,0)
7th speed 1/min: 1000
Del.quantity cm3/: 35,5...36,5 E
1000H.: (33,5...38,5) E
8th speed 1/min: 500
Del.quantity cm3/: 30,5...31,5 F
1000H.: (26,0...36,0) F

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 425
ELAB volt: -
Del.quantity cm3/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 425
Del.quantity cm3/: 16,0...20,0
1000H.: (14,0...22,0)
2nd speed 1/min: 500
Del.quantity cm3/: 9,5...17,5
1000H.: (7,5...19,5)

Arrangement of drivers on engine-
speed lever for exhaust-gas-
recirculation valve linkage (guage)

1st speed 1/min: 1250
Del.quantity cm3/: 23,0...24,0
1000H.: (21,5...26,0)

Automatic starting fuel delivery:

1st speed 1/min: 300
Del.quantity cm3/: -
ind. 1000H.: 30,0

2nd speed 1/min: 480
Del.quantity cm3/: -
max. 1000H.: 34,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : 3,2...3,4
KF mm : K-OT
MS mm : 1,3...1,7
SVS max. mm : 3,8
XK mm : 17,0...19,0
XL mm : 10,9...14,5

Remarks:

Pump/engine assignment:
Stroke in blocking position 0.73...
0.83 mm, referenced to outlet "B".
Attach timing-device cover
KDEP 1151.

F = Adjustment point for low full-load
delivery

E = Fuel-delivery adjustment point in
HBA range. (Correction by way of HBA
adjusting screw).

D = Adjustment point for high full-
load delivery

Adjust part-load delivery:
Setting = 12.0 mm

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : S0F 2,5 R
Edition : 24.10.89
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 4/11F1900 R294
Type number : O 460 414 054

Customer-specific information
Customer : IVECO

Engine : 8140.27.200

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : -
(from BDC): -

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 1,5...1,9

Supply-pump pressure:

Speed 1/min: 1100

F27

Charge press. hPa: 1000
Setting value bar: 5,8...6,4

Full-load del. with charge press.:

Speed 1/min: 1750
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 54,5...55,5
Dispersion cm3/ : 3,5
1000H : (4,0)

Full-load del. w/out charge press.:

Speed 1/min : 550
Del.quantity cm3/
1000H.: 21,0...22,0

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: -
Del.quantity cm3/
1000H.: 13,0...17,0
Dispersion cm3/ : 3,0
1000H.: (3,5)

Full-load speed regulation:

Speed 1/min: 2200
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 17,5...23,5

Start:

Speed 1/min: 100
Charge press. hPa: -
Del.quantity : -
mind cm3/1000H.: 40,0

Load-dependent start of delivery:

Speed 1/min: 1750
Charge press. hPa: 1000

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: 1,5...1,9
mm: (1,0...2,4)
2nd speed 1/min: 1500
Charge press. hPa: 1000
TD travel mm: 3,9...4,7
mm: (3,6...5,0)

3rd speed 1/min: 1750
Charge press. hPa: 1000
TD travel mm: 5,1...5,9
mm: (4,8...6,2)

Supply-pump pressure characteristic:

1st speed 1/min: 550
Charge press. hPa: 1000
Supply-pump pressure bar: 4,1...4,7
2nd speed 1/min: 1100
Charge press. hPa: 1000
Supply-pump pressure bar: 5,8...6,4
3rd speed 1/min: 1750
Charge press. hPa: 1000
Supply-pump pressure bar: 7,7...8,3

Overflow quantity at overflow valve:

1st speed 1/min: 550
Charge press. hPa: -
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1900
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800*
Charge-air pressure-setting point hPa: 550
LDA stroke mm: 4,7
Del.quantity cm³/: 42,0...43,0
1000H.: (38,5...46,5)
2nd speed 1/min: 2350
Charge press. hPa: 1000
Del.quantity cm³/: 0,0...5,0
1000H.: -
3rd speed 1/min: 2200
Charge press. hPa: 1000
Del.quantity cm³/: 17,5...23,5
1000H.: (16,0...25,0)
4th speed 1/min: 2100
Charge press. hPa: 1000
Del.quantity cm³/: 35,5...43,5
1000H.: (33,5...45,5)
5th speed 1/min: 1900
Charge press. hPa: 1000
Del.quantity cm³/: 50,5...55,5
1000H.: (49,5...56,5)
6th speed 1/min: 1750
Charge press. hPa: 1000
Del.quantity cm³/: 54,5...55,5
1000H.: (51,5...58,5)
7th speed 1/min: 1500

Charge press. hPa: 1000
Del.quantity cm³/: 53,5...58,5
1000H.: (52,5...59,5)
8th speed 1/min: 1000
Charge press. hPa: 1000
Del.quantity cm³/: 52,5...57,5
1000H.: (51,0...59,0)
9th speed 1/min: 800
Charge press. hPa: 550
Del.quantity cm³/: 42,0...43,0
1000H.: (38,5...46,5)
10th speed 1/min: 550
Charge press. hPa: 1000
Del.quantity cm³/: 52,5...58,5
1000H.: (51,5...59,5)
11th speed 1/min: 550
Charge press. hPa: -
Del.quantity cm³/: 21,0...22,0
1000H.: (18,0...25,0)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 13,0...17,0
1000H.: (11,0...19,0)
2nd speed 1/min: 450
Del.quantity cm³/: 0,0...5,0
1000H.: -
3rd speed 1/min: 325
Del.quantity cm³/: 37,0...47,0
1000H.: (36,0...48,0)

Automatic starting fuel delivery:

1st speed 1/min: 350
Del.quantity cm³/: -
ind. 1000H: 42,0
2nd speed 1/min: 450
Del.quantity cm³/: -
max. 1000H : 48,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: K-OT
MS	mm	: 0,6...1,0
XK	mm	: 21,8...23,8
XL	mm	: 12,3...15,7

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER 5,0 B1
Edition : 06.11.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/11F1250 R266-2
Type number : 0 460 414 057

Customer-specific information
Customer : PERKINS

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : 0,5
(from BDC): +0,02(0,04)

Start of delivery block
Piston stroke mm: 1,42
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Setting value mm: 2,4...2,8

Supply-pump pressure:

Speed 1/min: 1100
Setting value bar: 4,9...5,5

Full-load del. w/out charge press.:

Speed 1/min: 600
Del.quantity cm3/
1000H.: 24,0...25,0
Dispersion cm3/: 3,5
1000H.: -

Low-idle speed regulation:

Speed 1/min: 350
Del.quantity cm3/
1000H.: 11,0...15,0
Dispersion cm3/: 3,0
1000H.: -

Full-load speed regulation:

Speed 1/min: 1350
Del.quantity cm3/
1000H: 12,0...18,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 70,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 700
TD travel mm: 0,4...1,2
mm: (0,1...1,5)
2nd speed 1/min: 1100
TD travel mm: 2,4...2,8
mm: (1,9...3,3)
3rd speed 1/min: 1250
TD travel mm: 2,8...3,6
mm: (2,5...3,9)

Supply-pump pressure characteristic:

1st speed 1/min: 700
Supply-pump
pressure bar: 3,5...4,1
2nd speed 1/min: 1100
Supply-pump
pressure bar: 4,9...5,5
3rd speed 1/min: 1250
Supply-pump
pressure bar: 5,4...6,0

Overflow quantity at overflow valve:

1st speed 1/min: 600

Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1250
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1430
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1350
Del.quantity cm³/: 12,0...18,0
1000H.: (10,0...20,0)
3rd speed 1/min: 1250
Del.quantity cm³/: 46,5...49,5
1000H.: (45,0...51,0)
4th speed 1/min: 1100
Del.quantity cm³/: 47,0...50,0
1000H.: (45,5...51,5)
5th speed 1/min: 800
Del.quantity cm³/: 34,0...36,0
1000H.: -
6th speed 1/min: 600
Del.quantity cm³/: 24,0...25,0
1000H.: (22,0...27,0)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 350
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 350
Del.quantity cm³/: 11,0...15,0
1000H.: (9,0...17,0)
2nd speed 1/min: 400
Del.quantity cm³/: 3,0...9,0
1000H.: (1,5...10,5)
3rd speed 1/min: 460
Del.quantity cm³/: 0,0...5,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 300
Del.quantity cm³/: -
ind. 1000H.: 36,0
2nd speed 1/min: 400
Del.quantity cm³/: -
max. 1000H.: 40,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: K-0T
MS	mm	: 1,1...1,5
SVS max.	mm	: 4,1

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SOF 2,5 K3
Edition : 02.11.89
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 4/11F1900 R127-3
Type number : 0 460 414 060

Customer-specific information
Customer : IVECO-SOFIM

Engine : 8140.21.290

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 023

Opening
pressure bar : 172...175

Perforated-plate
diameter mm : 0.4

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02(0,04)$

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 2,5...2,9

Supply-pump pressure:

Speed 1/min: 1100

G04

Charge press. hPa: 1000
Setting value bar: 4,7...5,3

Full-load del. with charge press.:

Speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 44,7...45,7
Dispersion cm³/: 3,5
1000H.: (4,0)

Full-load del. w/out charge press.:

Speed 1/min: 500
Del.quantity cm³/
1000H.: 38,5...39,5

Low-idle speed regulation:

Speed 1/min: 400
Charge press. hPa: -
Del.quantity cm³/
1000H.: 13,0...17,0
Dispersion cm³/: 3,0
1000H.: (4,0)

Full-load speed regulation:

Speed 1/min: 2300
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 15,0...21,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 60,0

Load-dependent start of delivery:

Speed 1/min: 1100
Charge press. hPa: -

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
Charge press. hPa: 1000
TD travel mm: 0,5...1,3
mm: (0,2...1,6)
2nd speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: 2,5...2,9
mm: (2,0...3,4)
3rd speed 1/min: 1500

Charge press. hPa: 1000
 TD travel mm: 4,3...5,1
 mm: (4,0...5,4)
 4th speed 1/min: 1900
 Charge press. hPa: 1000
 TD travel mm: 6,1...6,9
 mm: (5,8...7,2)

Supply-pump pressure characteristic:

1st speed 1/min: 500
 Charge press. hPa: 1000
 Supply-pump pressure bar: 2,7...3,3
 2nd speed 1/min: 1100
 Charge press. hPa: 1000
 Supply-pump pressure bar: 4,7...5,3
 3rd speed 1/min: 1900
 Charge press. hPa: 1000
 Supply-pump pressure bar: 7,0...7,6

Overflow quantity at overflow valve:

1st speed 1/min: 500
 Charge press. hPa: -
 Overflow : 41...83
 quantity cm³/10s: (26...98)
 2nd speed 1/min: 1900
 Charge press. hPa: 1000
 Overflow : 55...138
 quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 900
 Charge-air pressure-setting point hPa: 400
 Del.quantity cm³/: 37,5...38,5
 1000H.: (35,3...40,7)
 2nd speed 1/min: 2450
 Charge press. hPa: 1000
 Del.quantity cm³/: 0,0...5,0
 1000H.: -
 3rd speed 1/min: 2300
 Charge press. hPa: 1000
 Del.quantity cm³/: 15,0...21,0
 1000H.: (13,5...22,5)
 4th speed 1/min: 2100
 Charge press. hPa: 1000
 Del.quantity cm³/: 30,0...38,0
 1000H.: (29,5...38,5)
 5th speed 1/min: 1900
 Charge press. hPa: 1000
 Del.quantity cm³/: 41,5...44,1
 1000H.: (40,1...45,5)
 6th speed 1/min: 1500
 Charge press. hPa: 1000

Del.quantity cm³/: 42,2...44,8
 1000H.: (40,8...46,2)
 7th speed 1/min: 1100
 Charge press. hPa: 1000
 Del.quantity cm³/: 44,7...45,7
 1000H.: (42,5...47,9)
 8th speed 1/min: 900
 Charge press. hPa: 400
 Del.quantity cm³/: 37,5...38,5
 1000H.: (35,3...40,7)
 9th speed 1/min: 500
 Charge press. hPa: 1000
 Del.quantity cm³/: 50,7...54,5
 1000H.: -
 10th speed 1/min: 500
 Charge press. hPa: -
 Del.quantity cm³/: 38,5...39,5
 1000H.: (36,3...41,7)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 400
 ELAB volt: -
 Del.quantity cm³/: 0,0...3,0
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 400
 Del.quantity cm³/: 0,0...5,0
 1000H.: -
 2nd speed 1/min: 350
 Del.quantity cm³/: 27,0...33,0
 1000H.: (25,5...34,5)
 3rd speed 1/min: 550
 Del.quantity cm³/: 0,0...5,0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 200
 Del.quantity cm³/: -
 ind. 1000H: 70,0
 2nd speed 1/min: 350
 Del.quantity cm³/: -
 max. 1000H : 70,0

Shutoff electromagnet:

Cut-in
 min. voltage : 10,0
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: K-OT
MS	mm	: 0,8...1,2
SVS max.	mm	: 4,8

Remarks:

Operate control lever after each
manifold-pressure compensator pressure
change.

* Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR 2,5 E
Edition : 07.11.89
replaces : 12.05.89
Calibrating oil : ISO 4113

Injection pump : VE 4/11F2000 RR288-3
Type number : 0 460 414 062

Customer-specific information
Customer : FORD

Engine : 2,5 DI

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 023

Opening
pressure bar : 172...175

Perforated-plate
diameter mm : 0.4

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : -
(from BDC) : -

Start of delivery block
Piston stroke mm: 0,78
mm: 0,73...0,83
Outlet : B

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250
Setting value mm: 2,5...2,9

Supply-pump pressure:

Speed 1/min: 1250
Setting value bar: 5,6...6,2

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 30,5...31,5 F

Low-idle speed regulation:

Speed 1/min: 425
Del.quantity cm3/
1000H.: 18,0...22,0

Full-load speed regulation:

Speed 1/min: 2100
Del.quantity cm3/
1000H: 30,5...34,5

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 62,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
TD travel mm: 0,0...0,8
mm: (0,0...1,1)
2nd speed 1/min: 1250
TD travel mm: 2,5...2,9
mm: (2,2...3,2)
3rd speed 1/min: 1950
TD travel mm: 6,0...6,8
mm: (5,7...7,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 3,1...3,7
2nd speed 1/min: 1000
Supply-pump
pressure bar: 4,8...5,4
3rd speed 1/min: 1250
Supply-pump
pressure bar: 5,6...6,2
4th speed 1/min: 1950
Supply-pump
pressure bar: 7,7...8,3

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 55...100
quantity cm³/10s: (40...115)
2nd speed 1/min: 1950
Overflow : 83...153
quantity cm³/10s: (68...168)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1950
HBA stroke mm: 10,0
Del.quantity cm³/: 37,0...40,6 D
1000H.: (36,3...41,3) D
2nd speed 1/min: 2400
Del.quantity cm³/: 0,0...10,0
1000H.: -
3rd speed 1/min: 2200
Del.quantity cm³/: 18,0...26,0
1000H.: (16,0...28,0)
4th speed 1/min: 2100
Del.quantity cm³/: 30,5...34,5
1000H.: (27,5...37,5)
5th speed 1/min: 1950
Del.quantity cm³/: 37,0...40,6
1000H.: (36,3...41,3)
6th speed 1/min: 1700
Del.quantity cm³/: 37,7...41,3
1000H.: (37,0...42,0)
7th speed 1/min: 1000
Del.quantity cm³/: 35,5...36,5 E
1000H.: (33,5...38,5) E
8th speed 1/min: 500
Del.quantity cm³/: 30,5...31,5 F
1000H.: (26,0...36,0) F

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 425
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 425
Del.quantity cm³/: 18,0...22,0
1000H.: (16,0...24,0)
2nd speed 1/min: 500
Del.quantity cm³/: 11,5...19,5
1000H.: (9,5...21,5)

Arrangement of drivers on engine-
speed lever for exhaust-gas-
recirculation valve linkage (guage)

1st speed 1/min: 1250
Del.quantity cm³/: 23,0...24,0
1000H.: (21,5...26,0)

Automatic starting fuel delivery:

1st speed 1/min: 300
Del.quantity cm³/: -
ind. 1000H.: 30,0

2nd speed 1/min: 480
Del.quantity cm³/: -
max. 1000H.: 34,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: K-OT
MS	mm	: 1,3...1,7
SVS max.	mm	: 3,8
XK	mm	: 17,0...19,0
XL	mm	: 10,9...14,5

Remarks:

Pump/engine assignment:
Stroke in blocking position 0.73...
0.83 mm, referenced to outlet "B".
Attach timing-device cover
KDEP 1151.

F = Adjustment point for low full-load
delivery

E = Fuel-delivery adjustment point in
HBA range. (Correction by way of HBA
adjusting screw).

D = Adjustment point for high full-
load delivery

Adjust part-load delivery:

Setting = 12.0 mm

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER 6,0 D1
Edition : 10.11.89
replaces : 10.07.89
Calibrating oil : ISO 4113

Injection pump : VE 4/11F2250 R327
Type number : 0 460 414 065

Customer-specific information
Customer : PERKINS

Engine : PRIMA N/A

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : -
(from BDC): -

Start of delivery block
Piston stroke mm: 1,1
mm: -

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1800
Setting value mm: 4,2...4,6
KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1800
Setting value bar: 6,7...7,3
KSB solenoid-operated
valve volt: 12,0

Full-load del. w/out charge press.:

Speed 1/min : 450
Del.quantity cm3/
1000H.: 32,0...33,0 F
KSB solenoid-operated
valve volt: 12,0

Low-idle speed regulation:

Speed 1/min: 400
Del.quantity cm3/
1000H.: 7,0...9,0
KSB solenoid-operated
valve volt: 12,0

Full-load speed regulation:

Speed 1/min: 2500
Del.quantity cm3/
1000H.: 28,0...30,0
KSB solenoid-operated
valve volt: 12,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 70,0
KSB solenoid-operated
valve volt: 12,0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,7...1,9
mm: (1,0...2,6) *

KSB solenoid-operated
valve volt: -
2nd speed 1/min: 1200
TD travel mm: 1,4...3,4 *
mm: -

KSB solenoid-operated
valve volt: -
3rd speed 1/min: 1200
TD travel mm: 1,1...1,9
mm: (0,8...2,2)

KSB solenoid-operated
valve volt: 12,0

4th speed 1/min: 1500
TD travel mm: 2,5...3,3
mm: (2,2...3,6)

KSB solenoid-operated
valve volt: 12,0

5th speed 1/min: 1800
TD travel mm: 4,2...4,6
mm: (3,7...5,1)

KSB solenoid-operated
valve volt: 12,0

6th speed 1/min: 2250
TD travel mm: 6,4...7,2
mm: (6,1...7,5)

KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure characteristic:

1st speed 1/min: 1000
Supply-pump pressure bar: 5,3...5,9

KSB solenoid-operated
valve volt: 12,0

2nd speed 1/min: 1000

Supply-pump pressure bar: 5,3...5,9

KSB solenoid-operated
valve volt: 12,0

3rd speed 1/min: 1800

Supply-pump pressure bar: 6,7...7,3

KSB solenoid-operated
valve volt: 12,0

4th speed 1/min: 2250

Supply-pump pressure bar: 7,5...8,1

KSB solenoid-operated
valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 450
KSB solenoid-operated
valve volt: 12,0
Overflow quantity cm³/10s: (72...116)
(57...131)

2nd speed 1/min: 2250
KSB solenoid-operated
valve volt: 12,0
Overflow quantity cm³/10s: (55...111)
(40...126)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2250
HBA stroke mm: 10,0
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 53,5...58,5 D
1000H.: (52,0...60,0) D

2nd speed 1/min: 2600
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 0,0...15,0
1000H.: -

3rd speed 1/min: 2500
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 28,0...30,0
1000H.: (25,0...33,0)

4th speed 1/min: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 47,5...48,5 E
1000H.: (45,0...51,0) E

5th speed 1/min: 450
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 32,0...33,0 F
1000H.: (28,5...36,5) F

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 400
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 400
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 7,0...9,0
1000H.: (4,0...12,0)
2nd speed 1/min: 500
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 1,5...7,5
1000H.: (0,5...8,5)

Automatic starting fuel delivery:

1st speed 1/min: 100
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: -
ind. 1000H: 70,0

2nd speed 1/min: 400
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: -
max. 1000H: 50,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: K-OT
MS	mm	: 1,1...1,5
XK	mm	: 20,0...22,0
XL	mm	: 10,5...13,9

Remarks:

* Unscrew KSB ball valve 2 mm

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SOF 2,5 R1
Edition : 24.10.89
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 4/11F1900 R294-1
Type number : 0 460 414 066

Customer-specific information
Customer : IVECO

Engine : 8140.27.200

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. , C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : -
(from BDC): -

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 1,5...1,9

Supply-pump pressure:

Speed 1/min: 1100

Charge press. hPa: 1000
Setting value bar: 5,8...6,4

Full-load del. with charge press.:

Speed 1/min: 1750
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 54,5...55,5
Dispersion cm3/ : 3,5
1000H : (4,0)

Full-load del. w/out charge press.:

Speed 1/min : 550
Del.quantity cm3/
1000H.: 21,0...22,0

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: -
Del.quantity cm3/
1000H.: 13,0...17,0
Dispersion cm3/ : 3,0
1000H.: (3,5)

Full-load speed regulation:

Speed 1/min: 2200
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 17,5...23,5

Start:

Speed 1/min: 100
Charge press. hPa: -
Del.quantity : -
mind cm3/1000H.: 40,0

Load-dependent start of delivery:

Speed 1/min: 1750
Charge press. hPa: 1000

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: 1,5...1,9
mm: (1,0...2,4)
2nd speed 1/min: 1500
Charge press. hPa: 1000
TD travel mm: 3,9...4,7
mm: (3,6...5,0)

3rd speed 1/min: 1750
Charge press. hPa: 1000
TD travel mm: 5,1...5,9
mm: (4,8...6,2)

Supply-pump pressure characteristic:

1st speed 1/min: 550
Charge press. hPa: 1000
Supply-pump pressure bar: 4,1...4,7
2nd speed 1/min: 1100
Charge press. hPa: 1000
Supply-pump pressure bar: 5,8...6,4
3rd speed 1/min: 1750
Charge press. hPa: 1000
Supply-pump pressure bar: 7,7...8,3

Overflow quantity at overflow valve:

1st speed 1/min: 550
Charge press. hPa: -
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1900
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800*
Charge-air pressure-setting point hPa: 550
LDA stroke mm: 4,7
Del.quantity cm³/: 42,0...43,0
1000H.: (38,5...46,5)
2nd speed 1/min: 2350
Charge press. hPa: 1000
Del.quantity cm³/: 0,0...5,0
1000H.: -
3rd speed 1/min: 2200
Charge press. hPa: 1000
Del.quantity cm³/: 17,5...23,5
1000H.: (16,0...25,0)
4th speed 1/min: 2100
Charge press. hPa: 1000
Del.quantity cm³/: 35,5...43,5
1000H.: (33,5...45,5)
5th speed 1/min: 1900
Charge press. hPa: 1000
Del.quantity cm³/: 50,5...55,5
1000H.: (49,5...56,5)
6th speed 1/min: 1750
Charge press. hPa: 1000
Del.quantity cm³/: 54,5...55,5
1000H.: (51,5...58,5)
7th speed 1/min: 1500

Charge press. hPa: 1000
Del.quantity cm³/: 53,5...58,5
1000H.: (52,5...59,5)
8th speed 1/min: 1000
Charge press. hPa: 1000
Del.quantity cm³/: 52,5...57,5
1000H.: (51,0...59,0)
9th speed 1/min: 800
Charge press. hPa: 550
Del.quantity cm³/: 42,0...43,0
1000H.: (38,5...46,5)
10th speed 1/min: 550
Charge press. hPa: 1000
Del.quantity cm³/: 52,5...58,5
1000H.: (51,5...59,5)
11th speed 1/min: 550
Charge press. hPa: -
Del.quantity cm³/: 21,0...22,0
1000H.: (18,0...25,0)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 13,0...17,0
1000H.: (11,0...19,0)
2nd speed 1/min: 450
Del.quantity cm³/: 0,0...5,0
1000H.: -
3rd speed 1/min: 325
Del.quantity cm³/: 37,0...47,0
1000H.: (36,0...48,0)

Automatic starting fuel delivery:

1st speed 1/min: 350
Del.quantity cm³/: -
ind. 1000H: 42,0
2nd speed 1/min: 450
Del.quantity cm³/: -
max. 1000H : 48,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: K-OT
MS	mm	: 0,6...1,0
XK	mm	: 21,8...23,8
XL	mm	: 13,7...17,1

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SOF 2,5 K4
Edition : 02.11.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/11F1900 R127-4
Type number : 0 460 414 068

Customer-specific information
Customer : IVECO-SOFIM

Engine : 8140.27

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 023

Opening
pressure bar : 172...175

Perforated-plate
diameter mm : 0.4

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02(0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 4,4...4,8

Supply-pump pressure:

Speed 1/min: 1100

Charge press. hPa: 1000
Setting value bar: 4,5...5,1

Full-load del. with charge press.:

Speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 39,0...40,0
Dispersion cm³/
1000H.: 3,5
(4,0)

Full-load del. w/out charge press.:

Speed 1/min: 500
Del.quantity cm³/
1000H.: 39,0...40,0

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del.quantity cm³/
1000H.: 13,0...17,0
Dispersion cm³/
1000H.: 3,0
(4,0)

Full-load speed regulation:

Speed 1/min: 2300
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 15,0...19,0

Start:

Speed 1/min: 100
Charge press. hPa: -
Del.quantity : -
mind cm³/1000H.: 60,0

Load-dependent start of delivery:

Speed 1/min: 1100
Charge press. hPa: -

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
TD travel mm: 1,3...2,1
(1,0...2,4)
2nd speed 1/min: 800
Charge press. hPa: 1000
TD travel mm: 2,8...3,6
(2,5...3,9)

3rd speed 1/min: 1100
 Charge press. hPa: 1000
 TD travel mm: 4,4...4,8
 mm: (3,9...5,3)
 4th speed 1/min: 1500
 Charge press. hPa: 1000
 TD travel mm: 6,1...6,9
 mm: (5,8...7,2)

Supply-pump pressure characteristic:

1st speed 1/min: 500
 Charge press. hPa: 1000
 Supply-pump pressure bar: 2,7...3,3
 2nd speed 1/min: 1100
 Charge press. hPa: 1000
 Supply-pump pressure bar: 4,5...5,1
 3rd speed 1/min: 1500
 Charge press. hPa: 1000
 Supply-pump pressure bar: 5,6...6,2

Overflow quantity at overflow valve:

1st speed 1/min: 500
 Charge press. hPa: -
 Overflow : 41...83
 quantity cm³/10s: (26...98)
 2nd speed 1/min: 1900
 Charge press. hPa: 1000
 Overflow : 55...138
 quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 900
 Charge-air pressure-setting point hPa: 400
 Del.quantity cm³/: 38,0...39,0
 1000H.: (35,8...41,2)
 2nd speed 1/min: 2450
 Charge press. hPa: 1000
 Del.quantity cm³/: 0,0...5,0
 1000H.: -
 3rd speed 1/min: 2300
 Charge press. hPa: 1000
 Del.quantity cm³/: 15,0...19,0
 1000H.: (12,5...21,5)
 4th speed 1/min: 2150
 Charge press. hPa: 1000
 Del.quantity cm³/: 24,5...32,5
 1000H.: (23,5...33,5)
 5th speed 1/min: 1900
 Charge press. hPa: 1000
 Del.quantity cm³/: 36,9...39,5
 1000H.: (35,5...40,9)
 6th speed 1/min: 1500
 Charge press. hPa: 1000

Del.quantity cm³/: 37,2...39,8
 1000H.: (35,8...41,2)
 7th speed 1/min: 1100
 Charge press. hPa: 1000
 Del.quantity cm³/: 39,0...40,0
 1000H.: (36,8...42,2)
 8th speed 1/min: 900
 Charge press. hPa: 400
 Del.quantity cm³/: 38,0...39,0
 1000H.: (35,8...41,2)
 9th speed 1/min: 500
 Charge press. hPa: 1000
 Del.quantity cm³/: 47,2...50,8
 1000H.: -
 10th speed 1/min: 500
 Charge press. hPa: -
 Del.quantity cm³/: 39,0...40,0
 1000H.: (36,8...42,2)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 350
 ELAB volt: -
 Del.quantity cm³/: 0,0...3,0
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 350
 Del.quantity cm³/: 13,0...17,0
 1000H.: (10,5...19,5)
 2nd speed 1/min: 300
 Del.quantity cm³/: 27,0...35,0
 1000H.: (26,0...36,0)
 3rd speed 1/min: 500
 Del.quantity cm³/: 0,0...5,0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 300
 Del.quantity cm³/: -
 ind. 1000H: 60,0
 2nd speed 1/min: 400
 Del.quantity cm³/: -
 max. 1000H : 65,0

Shutoff electromagnet:

Cut-in
 min. voltage : 10,0
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: K-OT
MS	mm	: 1,0...1,4
SVS max.	mm	: 2,4

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SOF 2,5 P5
Edition : 24.10.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/11F1900 R350
Type number : 0 460 414 070

Customer-specific information
Customer : IVECO-SOFIM

Engine : 8140.27

TEST BENCH REQUIREMENTS

Calibrating oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 2.5...2.9

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value bar: 5.6...6.2

Full-load del. with charge press.:

Speed 1/min: 1750
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 55.0...56.0
Dispersion cm3/ : 3.5
1000H : (4.0)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 16.5...17.5

Low-idle speed regulation:

Speed 1/min: 325
Del.quantity cm3/
1000H.: 10.0...14.0
Dispersion cm3/ : 3.0
1000H.: (3.5)

Full-load speed regulation:

Speed 1/min: 2100
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 19.5...25.5

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 40.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 900
Charge press. hPa: 1000
TD travel mm: 1.1...1.9
mm: (0.8...2.2)
2nd speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: 2.5...2.9
mm: (2.0...3.4)
3rd speed 1/min: 1900
Charge press. hPa: 1000
TD travel mm: 7.1...7.9
mm: (6.8...8.2)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000

Supply-pump pressure bar: 3.6...4.2
bar: (3.3...4.5)
2nd speed 1/min: 1100
Charge press. hPa: 1000
Supply-pump pressure bar: 5.6...6.2
bar: (5.3...6.5)
3rd speed 1/min: 1900
Charge press. hPa: 1000
Supply-pump pressure bar: 7.6...8.2
bar: (7.3...8.5)

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1900
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800*
Charge-air pressure-setting point hPa: 400
Del.quantity cm³/: 42.5...43.5
1000H.: (39.0...47.0)
2nd speed 1/min: 2350
Charge press. hPa: 1000
Del.quantity cm³/: 0.0...5.0
1000H.: (0.0...5.0)
3rd speed 1/min: 2100
Charge press. hPa: 1000
Del.quantity cm³/: 19.5...25.5
1000H.: (18.0...27.0)
4th speed 1/min: 2000
Charge press. hPa: 1000
Del.quantity cm³/: 40.0...48.0
1000H.: (38.0...50.0)
5th speed 1/min: 1900
Charge press. hPa: 1000
Del.quantity cm³/: 51.0...56.0
1000H.: (50.0...57.0)
6th speed 1/min: 1750
Charge press. hPa: 1000
Del.quantity cm³/: 55.0...56.0
1000H.: (52.0...59.0)
7th speed 1/min: 1500
Charge press. hPa: 1000
Del.quantity cm³/: 52.5...57.5
1000H.: (51.5...58.5)
8th speed 1/min: 1000
Charge press. hPa: 1000
Del.quantity cm³/: 49.5...54.5
1000H.: (48.0...56.0)

9th speed 1/min: 500
Charge press. hPa: 1000
Del.quantity cm³/: 48.5...54.5
1000H.: (47.5...55.5)
10th speed 1/min: 500
Charge press. hPa: -
Del.quantity cm³/: 16.5...17.5
1000H.: (13.5...20.5)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 325
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 325
Del.quantity cm³/: 31...41
1000H.: (30...42)
2nd speed 1/min: 325
Del.quantity cm³/: 10...14
1000H.: (8.0...16.0)
3rd speed 1/min: 450
Del.quantity cm³/: 0.0...5.0
1000H.: (0.0...5.0)

Arrangement of drivers on engine-speed lever for exhaust-gas-recirculation valve linkage (guage)

1st speed 1/min: 1000
Charge press. hPa: 1000
Del.quantity cm³/: 6.1...7.1
1000H.: (3.1...10.1)

Automatic starting fuel delivery:

1st speed 1/min: 300
Del.quantity cm³/: -
ind. 1000H: 40.0
2nd speed 1/min: 400
Del.quantity cm³/: -
max. 1000H : 45.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation
K mm : 3.2...3.4

KF mm : K-OT
MS mm : 0.6...1.0
SVS max. mm : -

Operate control lever after each
manifold-pressure compensator pressure
change.

* Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR 2,5 F
Edition : 07.11.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/11F2000 R366
Type number : 0 460 414 073

Customer-specific information
Customer : FORD

Engine : 2,5 DI

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 023

Opening
pressure bar : 172...175

Perforated-plate
diameter mm : 0.4

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : -
(from BDC): -

Start of delivery block
Piston stroke mm : 0,78
mm : 0,73...0,83
Outlet : B

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250
Setting value mm: 2,5...2,9

Supply-pump pressure:

Speed 1/min: 1250
Setting value bar: 5,6...6,2

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 30,5...31,5 F

Low-idle speed regulation:

Speed 1/min: 425
Del.quantity cm³/
1000H.: 16,0...20,0

Full-load speed regulation:

Speed 1/min: 2100
Del.quantity cm³/
1000H: 30,5...34,5

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 62,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
TD travel mm: 0,0...0,8
mm: (0,0...1,1)
2nd speed 1/min: 1250
TD travel mm: 2,5...2,9
mm: (2,2...3,2)
3rd speed 1/min: 1950
TD travel mm: 6,0...6,8
mm: (5,7...7,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 3,1...3,7
2nd speed 1/min: 1000
Supply-pump
pressure bar: 4,8...5,4
3rd speed 1/min: 1250
Supply-pump
pressure bar: 5,6...6,2
4th speed 1/min: 1950
Supply-pump
pressure bar: 7,7...8,3

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 55...100
quantity cm³/10s: (40...115)
2nd speed 1/min: 1950
Overflow : 83...153
quantity cm³/10s: (68...168)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1950
HBA stroke mm: 10,0
Del.quantity cm³/: 37,0...40,6 D
1000H.: (36,3...41,3) D
2nd speed 1/min: 2400
Del.quantity cm³/: 0,0...10,0
1000H.: -
3rd speed 1/min: 2200
Del.quantity cm³/: 18,0...26,0
1000H.: (16,0...28,0)
4th speed 1/min: 2100
Del.quantity cm³/: 30,5...34,5
1000H.: (27,5...37,5)
5th speed 1/min: 1950
Del.quantity cm³/: 37,0...40,6
1000H.: (36,3...41,3)
6th speed 1/min: 1700
Del.quantity cm³/: 37,7...41,3
1000H.: (37,0...42,0)
7th speed 1/min: 1000
Del.quantity cm³/: 35,5...36,5 E
1000H.: (33,5...38,5) E
8th speed 1/min: 500
Del.quantity cm³/: 30,5...31,5 F
1000H.: (26,0...36,0) F

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 425
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 425
Del.quantity cm³/: 16,0...20,0
1000H.: (14,0...22,0)
2nd speed 1/min: 500
Del.quantity cm³/: 9,5...17,5
1000H.: (7,5...19,5)

Arrangement of drivers on engine-
speed lever for exhaust-gas-
recirculation valve linkage (guage)

1st speed 1/min: 1250
Del.quantity cm³/: 23,0...24,0
1000H.: (21,5...26,0)

Automatic starting fuel delivery:

1st speed 1/min: 300
Del.quantity cm³/: -
ind. 1000H.: 30,0

2nd speed 1/min: 480
Del.quantity cm³/: -
max. 1000H.: 34,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : 3,2...3,4
KF mm : K-OT
MS mm : 1,3...1,7
SVS max. mm : 3,8
XK mm : 17,0...19,0
XL mm : 10,9...14,5

Remarks:

Pump/engine assignment:
Stroke in blocking position 0.73...
0.83 mm, referenced to outlet "B".
Attach timing-device cover
KDEP 1151.

F = Adjustment point for low full-load
delivery

E = Fuel-delivery adjustment point in
HBA range. (Correction by way of HBA
adjusting screw).

D = Adjustment point for high full-
load delivery

Adjust part-load delivery:
Setting = 12.0 mm

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR 2,5 G
Edition : 07.11.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/11F2000 R366-1
Type number : 0 460 414 074

Customer-specific information
Customer : FORD

Engine : 2,5 DI

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 023

Opening
pressure bar : 172...175

Perforated-plate
diameter mm : 0.4

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : -
(from BDC): -

Start of delivery block
Piston stroke mm : 0,78
mm : 0,73...0,83
Outlet : B

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250
Setting value mm : 2,5...2,9

Supply-pump pressure:

Speed 1/min: 1250
Setting value bar: 5,6...6,2

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 30,5...31,5 F

Low-idle speed regulation:

Speed 1/min: 425
Del.quantity cm³/
1000H.: 18,0...22,0

Full-load speed regulation:

Speed 1/min: 2100
Del.quantity cm³/
1000H: 30,5...34,5

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 62,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
TD travel mm : 0,0...0,8
mm : (0,0...1,1)
2nd speed 1/min: 1250
TD travel mm : 2,5...2,9
mm : (2,2...3,2)
3rd speed 1/min: 1950
TD travel mm : 6,0...6,8
mm : (5,7...7,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 3,1...3,7
2nd speed 1/min: 1000
Supply-pump
pressure bar: 4,8...5,4
3rd speed 1/min: 1250
Supply-pump
pressure bar: 5,6...6,2
4th speed 1/min: 1950
Supply-pump
pressure bar: 7,7...8,3

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 55...100
quantity cm³/10s: (40...115)
2nd speed 1/min: 1950
Overflow : 83...153
quantity cm³/10s: (68...168)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1950
HBA stroke mm: 10,0
Del.quantity cm³/: 37,0...40,6 D
1000H.: (36,3...41,3) D
2nd speed 1/min: 2400
Del.quantity cm³/: 0,0...10,0
1000H.: -
3rd speed 1/min: 2200
Del.quantity cm³/: 18,0...26,0
1000H.: (16,0...28,0)
4th speed 1/min: 2100
Del.quantity cm³/: 30,5...34,5
1000H.: (27,5...37,5)
5th speed 1/min: 1950
Del.quantity cm³/: 37,0...40,6
1000H.: (36,3...41,3)
6th speed 1/min: 1700
Del.quantity cm³/: 37,7...41,3
1000H.: (37,0...42,0)
7th speed 1/min: 1000
Del.quantity cm³/: 35,5...36,5 E
1000H.: (33,5...38,5) E
8th speed 1/min: 500
Del.quantity cm³/: 30,5...31,5 F
1000H.: (26,0...36,0) F

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 425
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 425
Del.quantity cm³/: 18,0...22,0
1000H.: (16,0...24,0)
2nd speed 1/min: 500
Del.quantity cm³/: 11,5...19,5
1000H.: (9,5...21,5)

Arrangement of drivers on engine-
speed lever for exhaust-gas-
recirculation valve linkage (guage)

1st speed 1/min: 1250
Del.quantity cm³/: 23,0...24,0
1000H.: (21,5...26,0)

Automatic starting fuel delivery:

1st speed 1/min: 300
Del.quantity cm³/: -
ind. 1000H.: 30,0

2nd speed 1/min: 480
Del.quantity cm³/: -
max. 1000H.: 34,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: K-OT
MS	mm	: 1,3...1,7
SVS max.	mm	: 3,8
XK	mm	: 17,0...19,0
XL	mm	: 10,9...14,5

Remarks:

Pump/engine assignment:
Stroke in blocking position 0.73...
0.83 mm, referenced to outlet "B".
Attach timing-device cover
KDEP 1151.

F = Adjustment point for low full-load
delivery

E = Fuel-delivery adjustment point in
HBA range. (Correction by way of HBA
adjusting screw).

D = Adjustment point for high full-
load delivery

Adjust part-load delivery:

Setting = 12.0 mm

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR 2,5 H
Edition : 07.11.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/11F2000 R366-2
Type number : 0 460 414 075

Customer-specific information
Customer : FORD

Engine : 2,5 DI

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 023

Opening
pressure bar : 172...175

Perforated-plate
diameter mm : 0.4

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : -
(from BDC): -

Start of delivery block
Piston stroke mm : 0,78
mm : 0,73...0,83
Outlet : B

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250
Setting value mm : 2,5...2,9

Supply-pump pressure:

Speed 1/min: 1250
Setting value bar : 5,6...6,2

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 30,5...31,5 F

Low-idle speed regulation:

Speed 1/min: 425
Del.quantity cm³/
1000H.: 16,0...20,0

Full-load speed regulation:

Speed 1/min: 2100
Del.quantity cm³/
1000H: 30,5...34,5

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 62,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
TD travel mm : 0,0...0,8
mm : (0,0...1,1)
2nd speed 1/min: 1250
TD travel mm : 2,5...2,9
mm : (2,2...3,2)
3rd speed 1/min: 1950
TD travel mm : 6,0...6,8
mm : (5,7...7,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar : 3,1...3,7
2nd speed 1/min: 1000
Supply-pump
pressure bar : 4,8...5,4
3rd speed 1/min: 1250
Supply-pump
pressure bar : 5,6...6,2
4th speed 1/min: 1950
Supply-pump
pressure bar : 7,7...8,3

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 55...100
quantity cm³/10s: (40...115)
2nd speed 1/min: 1950
Overflow : 83...153
quantity cm³/10s: (68...168)

Delivery quant. and breakaway char.:

1st speed 1/min: 1950
HBA stroke mm: 10,0
Del.quantity cm³: 37,0...40,6 D
1000H.: (36,3...41,3) D
2nd speed 1/min: 2400
Del.quantity cm³: 0,0...10,0
1000H.: -
3rd speed 1/min: 2200
Del.quantity cm³: 18,0...26,0
1000H.: (16,0...28,0)
4th speed 1/min: 2100
Del.quantity cm³: 30,5...34,5
1000H.: (27,5...37,5)
5th speed 1/min: 1950
Del.quantity cm³: 37,0...40,6
1000H.: (36,3...41,3)
6th speed 1/min: 1700
Del.quantity cm³: 37,7...41,3
1000H.: (37,0...42,0)
7th speed 1/min: 1000
Del.quantity cm³: 35,5...36,5 E
1000H.: (33,5...38,5) E
8th speed 1/min: 500
Del.quantity cm³: 30,5...31,5 F
1000H.: (26,0...36,0) F

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 425
ELAB volt: -
Del.quantity cm³: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 425
Del.quantity cm³: 16,0...20,0
1000H.: (14,0...22,0)
2nd speed 1/min: 500
Del.quantity cm³: 9,5...17,5
1000H.: (7,5...19,5)

Automatic starting fuel delivery:

1st speed 1/min: 300

Del.quantity cm³: -
ind. 1000H: 30,0

2nd speed 1/min: 480
Del.quantity cm³: -
max. 1000H: 34,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: K-OT
MS	mm	: 1,3...1,7
SVS max.	mm	: 3,8
XK	mm	: 17,0...19,0
XL	mm	: 10,9...14,5

Remarks:

Pump/engine assignment:
Stroke in blocking position 0.73...
0.83 mm, referenced to outlet "B".
Attach timing-device cover
KDEP 1151.

F = Adjustment point for low full-load
delivery
E = Fuel-delivery adjustment point in
HBA range. (Correction by way of HBA
adjusting screw).
D = Adjustment point for high full-
load delivery

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 4,1 H1
Edition : 18.07.89
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 6/11F1900 L218-8
Type number : 0 460 416 065

Customer-specific information
Customer : PENTA

Engine : TAMD 41B

Power k: 132
Speed 1/mi: -

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. , C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02(0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1200
Charge press. hPa: 1000
Setting value mm: 2,0...2,4

Supply-pump pressure:

Speed 1/min: 1200

Charge press. hPa: 1000
Setting value bar: 5,9...6,5

Full-load del. with charge press.:

Speed 1/min: 1500
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 88,0...89,0
Dispersion cm3/ : 5,0
1000H : -

Full-load del. w/out charge press.:

Speed 1/min : 650
Del.quantity cm3/
1000H.: 58,5...59,5

Low-idle speed regulation:

Speed 1/min: 325
Charge press. hPa: -
Del.quantity cm3/
1000H.: 25,0...29,0

Full-load speed regulation:

Speed 1/min: 2050
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 67,0...73,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 80,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
Charge press. hPa: 1000
TD travel mm: 0,6...1,6
mm: (0,4...1,8)

2nd speed 1/min: 1200
Charge press. hPa: 1000
TD travel mm: 2,0...2,4
mm: (1,5...2,9)

3rd speed 1/min: 1700
Charge press. hPa: 1000
TD travel mm: 3,5...4,3
mm: (3,2...4,6)

4th speed 1/min: 1900
Charge press. hPa: 1000
TD travel mm: 3,7...4,5
mm: -

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 4,2...4,8
2nd speed 1/min: 1000
Charge press. hPa: 1000
Supply-pump pressure bar: 5,5...6,1
3rd speed 1/min: 1200
Charge press. hPa: 1000
Supply-pump pressure bar: 5,9...6,5
4th speed 1/min: 1900
Charge press. hPa: 1000
Supply-pump pressure bar: 7,4...8,0

Overflow quantity at overflow valve:

1st speed 1/min: 650
Charge press. hPa: 1000
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1900
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800*
Charge-air pressure-setting point hPa: 200
LDA stroke mm: 4,5
Del.quantity cm³/: 72,5...73,5
1000H.: (70,0...76,0)
2nd speed 1/min: 2200
Charge press. hPa: 1000
Del.quantity cm³/: 0,0...4,0
1000H.: -
3rd speed 1/min: 2150
Charge press. hPa: 1000
Del.quantity cm³/: 4,5...11,5
1000H.: -
4th speed 1/min: 2050
Charge press. hPa: 1000
Del.quantity cm³/: 67,0...73,0
1000H.: (64,0...76,0)
5th speed 1/min: 1900
Charge press. hPa: 1000
Del.quantity cm³/: 79,0...83,0
1000H.: (77,0...85,0)
6th speed 1/min: 1500
Charge press. hPa: 1000
Del.quantity cm³/: 88,0...89,0
1000H.: (86,2...90,8)
7th speed 1/min: 1200

Charge press. hPa: 1000
Del.quantity cm³/: 92,0...95,0
1000H.: (90,5...96,5)
8th speed 1/min: 800
Charge press. hPa: 200
Del.quantity cm³/: 72,5...73,5
1000H.: (70,0...76,0)
9th speed 1/min: 800
Charge press. hPa: 1000
Del.quantity cm³/: 78,5...81,5
1000H.: (77,0...83,0)
10th speed 1/min: 650
Charge press. hPa: -
Del.quantity cm³/: 58,5...59,5
1000H.: (56,0...62,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1900
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 325
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 325
Del.quantity cm³/: 25,0...29,0
1000H.: (22,0...32,0)
2nd speed 1/min: 400
Del.quantity cm³/: 5,0...11,0
1000H.: (3,5...12,5)
3rd speed 1/min: 480
Del.quantity cm³/: 0,0...3,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 300
Del.quantity cm³/: -
ind. 1000H: 70,0
2nd speed 1/min: 500
Del.quantity cm³/: -
max. 1000H : 70,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	K-OT
MS	mm	:	0,6...1,0
XK	mm	:	21,8...23,8
XL	mm	:	11,2...14,6

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 E2
Edition : 02.11.89
replaces : 11.12.86
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R226-2
Type number : 0 460 424 024

Customer-specific information
Customer : CDC

Engine : 4 BT 390 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. $^{\circ}\text{C}$:
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02(0,04)$

Start of delivery block
Piston stroke mm : 1.8
mm : $\pm 0,02(0,06)$

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Setting value mm: 2,0...2,4

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 4,6...5,2

Full-load del. with charge press.:

Speed 1/min: 1100
Del.quantity $\text{cm}^3/$
1000H.: 68,5...69,5
Dispersion $\text{cm}^3/$: 4,0
1000H : (4,5)

Low-idle speed regulation:

Speed 1/min: 335
Del.quantity $\text{cm}^3/$
1000H.: 8,0...14,0
Dispersion $\text{cm}^3/$: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1290
Del.quantity $\text{cm}^3/$
1000H: 58,0...64,0

Start:

Speed 1/min: 100
Del.quantity : -
mind $\text{cm}^3/1000\text{H.}$: 70,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 0,8...1,6
mm: (0,5...1,9)
2nd speed 1/min: 900
TD travel mm: 2,0...2,4
mm: (1,5...2,9)
3rd speed 1/min: 1100
TD travel mm: 2,9...3,7
mm: (2,6...4,0)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2,7...3,3
2nd speed 1/min: 750
Supply-pump
pressure bar: 3,9...4,5
3rd speed 1/min: 900

Supply-pump
pressure bar: 4,6...5,2
4th speed 1/min: 1100
Supply-pump
pressure bar: 5,4...6,0

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1250
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1450
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1400
Del.quantity cm³/: 0,0...15,0
1000H.: -
3rd speed 1/min: 1360
Del.quantity cm³/: 15,0...55,0
1000H.: -
4th speed 1/min: 1290
Del.quantity cm³/: 58,0...64,0
1000H.: (55,0...67,0)
5th speed 1/min: 1250
Del.quantity cm³/: 66,5...69,5
1000H.: (65,0...71,0)
6th speed 1/min: 1100
Del.quantity cm³/: 68,5...69,5
1000H.: (66,0...72,0)
7th speed 1/min: 750
Del.quantity cm³/: 73,0...77,0
1000H.: (71,0...79,0)
8th speed 1/min: 500
Del.quantity cm³/: 74,0...82,0
1000H.: (72,0...84,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm³/: -
1000H.: 0...3

Electr. shutoff:

Speed 1/min: 335
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 335

H03

Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 500
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H.: 75,0
2nd speed 1/min: 300
Del.quantity cm³/: -
max. 1000H.: 80,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,0...5,4
MS	mm	:	0,8...1,2
SVS max.	mm	:	4,2
XK	mm	:	18,8...20,8
XL	mm	:	11,5...14,9

Remarks:

: C.D.C. # 390 8183

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P
Edition : 20.10.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R359
Type number : 0 460 905 027

Customer-specific information
Customer : CDC

Engine : 4 BTA

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. : C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery block
Piston stroke mm: 1.25
mm: $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 2.0...2.4

Supply-pump pressure:

Speed 1/min: 1000
Charge press. hPa: 1000
Setting value bar: 4.9...5.5

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 83.0...84.0
Dispersion cm³ : 4.0
1000H : (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 53.0...54.0

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: -
Del.quantity cm³/
1000H.: 10.0...12.0
Dispersion cm³ : 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1330
Charge press. hPa: 1000
Del.quantity cm³/
1000H: 68.0...74.0

Start:

Speed 1/min: 100
Charge press. hPa: -
Del.quantity : -
mind cm³/1000H.: 80.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400
Charge press. hPa: -
TD travel mm: 2.9...3.9
mm: -

KSB solenoid-operated
valve volt: -
2nd speed 1/min: 1000
Charge press. hPa: 1000
TD travel mm: 1.9...1.7
mm: (0.6...2.0)

KSB solenoid-operated
valve volt: 12

3rd speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: 2.0...2.4
mm: (1.5...2.9)

KSB solenoid-operated
valve volt: 12
4th speed 1/min: 1250
Charge press. hPa: 1000
TD travel mm: 2.8...3.6
mm: (2.5...3.9)
KSB solenoid-operated
valve volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump
pressure bar: 2.6...3.2
KSB solenoid-operated
valve volt: 12
2nd speed 1/min: 1000
Charge press. hPa: 1000
Supply-pump
pressure bar: 4.9...5.5
KSB solenoid-operated
valve volt: 12
3rd speed 1/min: 1250
Charge press. hPa: 1000
Supply-pump
pressure bar: 6.0...6.6

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
KSB solenoid-operated
valve volt: 12
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1250
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
Charge-air pressure-setting
point hPa: 535
KSB solenoid-operated
valve volt: 12
Del.quantity cm³/: 71.5...72.5
1000H.: (68.0...76.0)
2nd speed 1/min: 1450
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12

Del.quantity cm³/: 0.0...3.0
1000H.: -

3rd speed 1/min: 1430
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12
Del.quantity cm³/: 15.0...45.0
1000H.: -

4th speed 1/min: 1330
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12
Del.quantity cm³/: 68.0...74.0
1000H.: (65.0...77.0)

5th speed 1/min: 1250
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12
Del.quantity cm³/: 76.5...79.5
1000H.: (75.0...81.0)

6th speed 1/min: 1100
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12
Del.quantity cm³/: 77.5...80.5
1000H.: (75.5...82.5)

7th speed 1/min: 850
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12
Del.quantity cm³/: 83.0...84.0
1000H.: (80.5...86.5)

8th speed 1/min: 500
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12
Del.quantity cm³/: 53.0...54.0
1000H.: (49.5...57.5)

9th speed 1/min: 500
Charge press. hPa: -
KSB solenoid-operated
valve volt: 12
Del.quantity cm³/: 94.0...104.0
1000H.: -

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
KSB solenoid-operated
valve volt: 12
Del.quantity cm³/: 10.0...12.0
1000H.: (6.0...16.0)
2nd speed 1/min: 450
KSB solenoid-operated
valve volt: 12
Del.quantity cm³/: 0.0...2.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 100
Charge press. hPa: -
KSB solenoid-operated
valve volt: 12
Del.quantity cm³/: -
ind. 1000H: 80.0

2nd speed 1/min: 130
Charge press. hPa: -
KSB solenoid-operated
valve volt: 12
Del.quantity cm³/: -
max. 1000H : 80.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation
K mm : 3.6...3.8
KF mm : K-OT
MS mm : 0.8...1.2
SVS max. mm : 2.1

Remarks:
: C.D.C. # 391 7535

Operate control lever after each
manifold-pressure compensator pressure
change.

* Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CAS 3,9 N
Edition : 07.11.89
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 4 12F1100 R370
Type number : 0 460 424 056

Customer-specific information
Customer : CASE

Engine : 4 BT

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02(0,04)$

Start of delivery block
Piston stroke mm : 1,55
mm: $\pm 0,02(0,06)$

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3,2...3,6

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 4,3...4,9

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm³/
1000H.: 85,5...86,5
Dispersion cm³/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 450
Del.quantity cm³/
1000H.: 10,0...16,0
Dispersion cm³/: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1160
Del.quantity cm³/
1000H: 44,5...50,5

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 60,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,7...2,5
mm: (1,4...2,8)
2nd speed 1/min: 750
TD travel mm: 3,2...3,6
mm: (2,7...4,1)
3rd speed 1/min: 1100
TD travel mm: 4,7...5,5
mm: (4,4...5,8)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 3,3...3,9
2nd speed 1/min: 750
Supply-pump
pressure bar: 4,3...4,9
3rd speed 1/min: 1100

Supply-pump
pressure bar: 5,9...6,5

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1100
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1200
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1180
Del.quantity cm³/: 15,0...55,0
1000H.: -
3rd speed 1/min: 1160
Del.quantity cm³/: 44,5...50,5
1000H.: (41,5...53,5)
4th speed 1/min: 1100
Del.quantity cm³/: 68,0...71,0
1000H.: (66,5...72,5)
5th speed 1/min: 900
Del.quantity cm³/: 74,5...79,5
1000H.: (73,0...81,0)
6th speed 1/min: 750
Del.quantity cm³/: 85,5...86,5
1000H.: (83,0...89,0)
7th speed 1/min: 500
Del.quantity cm³/: 85,0...93,0
1000H.: -

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 450
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 450
Del.quantity cm³/: 10,0...16,0
1000H.: (8,0...18,0)
2nd speed 1/min: 480
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 250
Del.quantity cm³/: -
ind. 1000H: 80,0

2nd speed 1/min: 400
Del.quantity cm³/: -
max. 1000H : 120,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,0...5,4
MS mm : 0,8...1,2
SVS max. mm : 1,1
XK mm : 18,8...20,8
XL mm : 11,0...14,4

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 N20
Edition : 24.10.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1150 R378
Type number : 0 460 424 058

Customer-specific information
Customer : CDC

Engine : 4 BT - 3.9 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.8
mm: $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Setting value mm: 2.0...2.4

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 4.2...4.8

Full-load del. w/out charge press.:

Speed 1/min : 900
Del.quantity cm³/
1000H.: 67.0...68.0
Dispersion cm³/: 4.0
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm³/
1000H.: 8.0...14.0
Dispersion cm³/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1190
Del.quantity cm³/
1000H: 47.0...53.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 70.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 0.8...1.6
mm: (0.5...1.9)
2nd speed 1/min: 900
TD travel mm: 2.0...2.4
mm: (1.5...2.9)
3rd speed 1/min: 1150
TD travel mm: 3.2...4.0
mm: (2.9...4.3)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.5...3.1
bar: (2.3...3.3)
2nd speed 1/min: 900
Supply-pump
pressure bar: 4.2...4.8
bar: (4.0...5.0)

3rd speed 1/min: 1150
Supply-pump
pressure bar: 5.2...5.8
bar: (5.0...6.0)

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1150
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300
Del.quantity cm³/: 0.0...3.0
1000H.: (0.0...3.0)
2nd speed 1/min: 1220
Del.quantity cm³/: 15.0...55.0
1000H.: (15.0...55.0)
3rd speed 1/min: 1190
Del.quantity cm³/: 47.0...53.0
1000H.: (44.0...56.0)
4th speed 1/min: 1150
Del.quantity cm³/: 63.5...66.5
1000H.: (62.0...68.0)
5th speed 1/min: 900
Del.quantity cm³/: 67.0...68.0
1000H.: (64.5...70.5)
6th speed 1/min: 750
Del.quantity cm³/: 69.5...73.5
1000H.: (67.5...77.5)
7th speed 1/min: 500
Del.quantity cm³/: 68.0...76.0
1000H.: (66.0...78.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1150
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAS volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 8.0...14.0
1000H.: (6.0...16.0)
2nd speed 1/min: 500

Del.quantity cm³/: 0.0...4.0
1000H.: (0.0...4.0)

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H.: 80.0

2nd speed 1/min: 240
Del.quantity cm³/: -
max. 1000H.: 80.0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5.0...5.4
MS	mm	:	1.1...1.5
SVS max.	mm	:	4.0

Remarks:

: C.D.C. # 391 7507

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 N21
Edition : 24.10.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R378-2
Type number : 0 460 424 060

Customer-specific information
Customer : CDC

Engine : 4 BT - 3.9 IND.

Power k: 73
Speed 1/mi: 2500

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): +0.02(0.04)

Start of delivery block
Piston stroke mm: 1.8
mm: +0.02(0.06)

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Setting value mm: 2.0...2.4

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 4.6...5.2

Full-load del. w/out charge press.:

Speed 1/min : 1100
Del.quantity cm3/
1000H.: 68.5...69.5
Dispersion cm3/: 4.0
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 335
Del.quantity cm3/
1000H.: 8.0...14.0
Dispersion cm3/: 5.0
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1290
Del.quantity cm3/
1000H: 58.0...64.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 70.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 0.8...1.6
mm: (0.5...1.9)

2nd speed 1/min: 900
TD travel mm: 2.0...2.4
mm: (1.5...2.9)

3rd speed 1/min: 1100
TD travel mm: 2.9...3.7
mm: (2.6...4.0)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.7...3.3
bar: (2.5...3.5)

2nd speed 1/min: 750

Supply-pump pressure bar: 3.9...4.5
 bar: (3.7...4.7)
 3rd speed 1/min: 900
 Supply-pump pressure bar: 4.6...5.2
 bar: (4.4...5.4)
 4th speed 1/min: 1100
 Supply-pump pressure bar: 5.4...6.0
 bar: (5.2...6.2)

Overflow quantity at overflow valve:

1st speed 1/min: 500
 Overflow : 41...83
 quantity cm3/10s: (26...98)
 2nd speed 1/min: 1250
 Overflow : 55...138
 quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1450
 Del.quantity cm3/: 0.0...3.0
 1000H.: (0.0...3.0)
 2nd speed 1/min: 1360
 Del.quantity cm3/: 15.0...55.0
 1000H.: (15.0...55.0)
 3rd speed 1/min: 1290
 Del.quantity cm3/: 58.0...64.0
 1000H.: (55.0...67.0)
 4th speed 1/min: 1250
 Del.quantity cm3/: 66.5...69.5
 1000H.: (65.0...71.0)
 5th speed 1/min: 1100
 Del.quantity cm3/: 68.5...69.5
 1000H.: (66.0...72.0)
 6th speed 1/min: 750
 Del.quantity cm3/: 73.0...77.0
 1000H.: (71.0...79.0)
 7th speed 1/min: 500
 Del.quantity cm3/: 74.0...82.0
 1000H.: (72.0...84.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
 Del.quantity cm3/: 0..3
 1000H.: -

Electr. shutoff:

Speed 1/min: 335
 ELAB volt: -
 Del.quantity cm3/: 0.0...3.0
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 335
 Del.quantity cm3/: 8.0...14.0
 1000H.: (6.0...16.0)
 2nd speed 1/min: 500
 Del.quantity cm3/: 0.0...4.0
 1000H.: (0.0...4.0)

Automatic starting fuel delivery:

1st speed 1/min: 130
 Del.quantity cm3/: -
 ind. 1000H: 75.0

2nd speed 1/min: 300
 Del.quantity cm3/: -
 max. 1000H : 80.0

Shutoff electromagnet:

Cut-in
 min. voltage : 10.0
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm : -
 KF mm : 5.0...5.4
 MS mm : 0.8...1.2
 SVS max. mm : -

Remarks:

: C.D.C. # 391 7510

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 N22
Edition : 24.10.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1050 R378-3
Type number : 0 460 424 061

Customer-specific information
Customer : CDC

Engine : 4 BT - 390 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm : 1.8
mm: $\pm 0.02(0.06)$

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Setting value mm: 2.3...2.7

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 4.1...4.7

Full-load del. w/out charge press.:

Speed 1/min : 900
Del.quantity cm3/
1000H.: 69.0...70.0
Dispersion cm3/: 4.0
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 10.0...11.0
Dispersion cm3/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1110
Del.quantity cm3/
1000H: 49.0...55.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 70.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 1.3...2.1
mm: (1.0...2.4)
2nd speed 1/min: 900
TD travel mm: 2.3...2.7
mm: (1.8...3.2)
3rd speed 1/min: 1050
TD travel mm: 2.8...3.6
mm: (2.5...3.9)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.3...2.9
bar: (2.1...3.1)
2nd speed 1/min: 900
Supply-pump
pressure bar: 4.1...4.7
bar: (3.9...4.9)
3rd speed 1/min: 1050

Supply-pump

pressure bar: 4.8...5.4
bar: (4.6...5.6)

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1050
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1200
Del.quantity cm³/: 0.0...3.0
1000H.: (0.0...3.0)
2nd speed 1/min: 1140
Del.quantity cm³/: 15.0...55.0
1000H.: (15.0...55.0)
3rd speed 1/min: 1110
Del.quantity cm³/: 49.0...55.0
1000H.: (46.0...58.0)
4th speed 1/min: 1050
Del.quantity cm³/: 66.0...69.0
1000H.: (64.5...70.5)
5th speed 1/min: 900
Del.quantity cm³/: 69.0...70.0
1000H.: (66.5...72.5)
6th speed 1/min: 750
Del.quantity cm³/: 72.0...76.0
1000H.: (70.0...78.0)
7th speed 1/min: 500
Del.quantity cm³/: 72.0...80.0
1000H.: (70.0...82.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1050
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 10...12
1000H.: (6.0...16.0)
2nd speed 1/min: 500
Del.quantity cm³/: 0.0...4.0
1000H.: (0.0...4.0)

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H: 80.0

2nd speed 1/min: 240
Del.quantity cm³/: -
max. 1000H : 80.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5.0...5.4
MS	mm	:	1.1...1.5
SVS max.	mm	:	-

Remarks:

: C.D.C. # 391 7035

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 N23
Edition : 25.10.89
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 4/12F1100 R378-4
Type number : 0 460 424 062

Customer-specific information
Customer : CDC

Engine : 4 BT - 3.9 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. : C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm : 1.8
mm : $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Setting value mm: 2.3...2.7

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 4.1...4.7

Full-load del. w/out charge press.:

Speed 1/min : 900
Del.quantity cm³/
1000H.: 67.5...68.5
Dispersion cm³/: 4.0
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 335
Del.quantity cm³/
1000H.: 8.0...14.0
Dispersion cm³/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1150
Del.quantity cm³/
1000H: 53.0...59.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 70.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 1.3...2.1
mm: (1.0...2.4)
2nd speed 1/min: 900
TD travel mm: 2.3...2.7
mm: (1.8...3.2)
3rd speed 1/min: 1100
TD travel mm: 3.1...3.9
mm: (2.8...4.2)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.3...2.9
bar: (2.1...3.1)
2nd speed 1/min: 900
Supply-pump
pressure bar: 4.1...4.7
bar: (3.9...4.9)

3rd speed 1/min: 1100
Supply-pump
pressure bar: 4.9...5.5
bar: (4.7...5.7)

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1100
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1250
Del.quantity cm³/: 0.0...3.0
1000H.: (0.0...3.0)
2nd speed 1/min: 1180
Del.quantity cm³/: 15.0...55.0
1000H.: (15.0...55.0)
3rd speed 1/min: 1150
Del.quantity cm³/: 53.0...59.0
1000H.: (50.0...56.0)
4th speed 1/min: 1100
Del.quantity cm³/: 64.5...67.5
1000H.: (63.0...69.0)
5th speed 1/min: 900
Del.quantity cm³/: 67.5...68.5
1000H.: (65.0...71.0)
6th speed 1/min: 750
Del.quantity cm³/: 70.0...74.0
1000H.: (68.0...76.0)
7th speed 1/min: 500
Del.quantity cm³/: 69.0...77.0
1000H.: (67.0...79.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 335
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 335
Del.quantity cm³/: 8.0...14.0
1000H.: (6.0...16.0)
2nd speed 1/min: 500

Del.quantity cm³/: 0.0...4.0
1000H.: (0.0...4.0)

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H.: 80.0

2nd speed 1/min: 240
Del.quantity cm³/: -
max. 1000H.: 80.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5.0...5.4
MS mm : 1.1...1.5
SVS max. mm : 3.2

Remarks:
: C.D.C. # 391 6929

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 P1
Edition : 02.11.89
replaces : 16.10.86
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R159-16
Type number : 0 460 426 066

Customer-specific information
Customer : CDC

Engine : 6BT-5.9 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02(0,04)

Start of delivery block
Piston stroke mm : 1,3
mm : +0,02(0,06)

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3,3...4,3

Full-load del. with charge press.:

Speed 1/min: 1100
Del.quantity cm³/
1000H.: 73,0...74,0
Dispersion cm³/
1000H : (4,5)

Low-idle speed regulation:

Speed 1/min: 360
Del.quantity cm³/
1000H.: 7,0...15,0
Dispersion cm³/
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1300
Del.quantity cm³/
1000H: 51,00...57,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 60,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,5...2,3
mm: (1,2...2,6)
2nd speed 1/min: 750
TD travel mm: 3,4...3,8
mm: (2,9...4,3)
3rd speed 1/min: 1100
TD travel mm: 5,2...6,0
mm: (4,9...6,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2,2...3,2
2nd speed 1/min: 750
Supply-pump
pressure bar: 3,3...4,3
3rd speed 1/min: 1100

Supply-pump
pressure bar: 4,6...5,6

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1250
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1400
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1390
Del.quantity cm³/: 0,0...15,0
1000H.: -
3rd speed 1/min: 1350
Del.quantity cm³/: 15,0...55,0
1000H.: -
4th speed 1/min: 1300
Del.quantity cm³/: 51,0...57,0
1000H.: (48,0...60,0)
5th speed 1/min: 1250
Del.quantity cm³/: 70,0...73,0
1000H.: (68,5...74,5)
6th speed 1/min: 1100
Del.quantity cm³/: 73,0...74,0
1000H.: (70,5...76,5)
7th speed 1/min: 900
Del.quantity cm³/: 74,5...78,5
1000H.: -
8th speed 1/min: 750
Del.quantity cm³/: 76,0...80,0
1000H.: (74,0...82,0)
9th speed 1/min: 500
Del.quantity cm³/: 64,0...72,0
1000H.: (62,0...74,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm³/: -
1000H.: 0...3

Electr. shutoff:

Speed 1/min: 360
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 360

H18

Del.quantity cm³/: 7,0...15,0
1000H.: (6,0...16,0)
2nd speed 1/min: 450
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H.: 70,0

2nd speed 1/min: 240
Del.quantity cm³/: -
max. 1000H.: 70,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,0...5,4
MS	mm	: 0,6...1,0
SVS max.	mm	: 0,9
XK	mm	: 18,8...20,8
XL	mm	: 11,8...15,2

Remarks:

: C.D.C. # 390 8198

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 P3
Edition : 02.11.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R159-16
Type number : 0 460 426 066
Customer Part-No. : 3 916 114

Customer-specific information
Customer : CDC

Engine : 6BT-5.9 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02(0,04)$

Start of delivery block
Piston stroke mm : 1,3
mm : $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750

Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3,3...4,3

Full-load del. with charge press.:

Speed 1/min: 1100
Del.quantity cm³/
1000H.: 73,0...74,0
Dispersion cm³/
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 360
Del.quantity cm³/
1000H.: 7,0...15,0
Dispersion cm³/
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1300
Del.quantity cm³/
1000H.: 51,00...57,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 60,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,5...2,3
mm: (1,2...2,6)
2nd speed 1/min: 750
TD travel mm: 3,4...3,8
mm: (2,9...4,3)
3rd speed 1/min: 1100
TD travel mm: 5,2...6,0
mm: (4,9...6,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2,2...3,2
2nd speed 1/min: 750
Supply-pump
pressure bar: 3,3...4,3
3rd speed 1/min: 1100

Supply-pump
pressure bar: 4,6...5,6

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1250
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1400
Del.quantity cm3/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1390
Del.quantity cm3/: 0,0...15,0
1000H.: -
3rd speed 1/min: 1350
Del.quantity cm3/: 15,0...55,0
1000H.: -
4th speed 1/min: 1300
Del.quantity cm3/: 51,0...57,0
1000H.: (48,0...60,0)
5th speed 1/min: 1250
Del.quantity cm3/: 70,0...73,0
1000H.: (68,5...74,5)
6th speed 1/min: 1100
Del.quantity cm3/: 73,0...74,0
1000H.: (70,5...76,5)
7th speed 1/min: 900
Del.quantity cm3/: 74,5...78,5
1000H.: -
8th speed 1/min: 750
Del.quantity cm3/: 76,0...80,0
1000H.: (74,0...82,0)
9th speed 1/min: 500
Del.quantity cm3/: 64,0...72,0
1000H.: (62,0...74,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm3/: -
1000H.: 0..3

Electr. shutoff:

Speed 1/min: 360
ELAB volt: -
Del.quantity cm3/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 360

H2O

Del.quantity cm3/: 7,0...15,0
1000H.: (6,0...16,0)
2nd speed 1/min: 450
Del.quantity cm3/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm3/: -
ind. 1000H.: 70,0

2nd speed 1/min: 240
Del.quantity cm3/: -
max. 1000H.: 70,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,0...5,4
MS mm : 0,6...1,0
SVS max. mm : 0,9
XK mm : 18,8...20,8
XL mm : 11,8...15,2

Remarks:

:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER 6,0 C
Edition : 06.11.89
replaces : 03.02.89
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1300 R240
Type number : 0 460 426 084

Customer-specific information
Customer : PERKINS

Engine : T6 60 CC TRU

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 020

Opening
pressure bar : 172...175

Perforated-plate
diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.25
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm : 1.0
mm : ± 0.02

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000

Setting value mm: 1.3...1.7

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value bar: 6.5...7.1

Full-load del. with charge press.:

Speed 1/min: 700
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 99.0...100.0
Dispersion cm³ : 5.0
1000H : -

Full-load del. w/out charge press.:

Speed 1/min : 700
Del.quantity cm³/
1000H.: 87.0...88.0

Low-idle speed regulation:

Speed 1/min: 300
Charge press. hPa: -
Del.quantity cm³/
1000H.: 16.5...20.5
Dispersion cm³ : 5.0
1000H.: -

Full-load speed regulation:

Speed 1/min: 1450
Charge press. hPa: 1000
Del.quantity cm³/
1000H: 47.0...53.0

Start:

Speed 1/min: 100
Charge press. hPa: -
Del.quantity : -
mind cm³/1000H.: 120.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
Charge press. hPa: 1000
TD travel mm: 0.3...1.1
mm: (0.0...1.4)
2nd speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: 1.3...1.7
mm: (0.8...2.2)

3rd speed 1/min: 1300
Charge press. hPa: 1000
TD travel mm: 2.0...2.8
mm: (1.7...3.1)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 3.9...4.5
2nd speed 1/min: 1100
Charge press. hPa: 1000
Supply-pump pressure bar: 6.5...7.1
3rd speed 1/min: 1300
Charge press. hPa: 1000
Supply-pump pressure bar: 7.3...7.9

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1300
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting point hPa: 400
LDA stroke mm: 6.3
Del.quantity cm³/: 95.0...96.0
1000H.: (92.5...98.5)
2nd speed 1/min: 1550
Charge press. hPa: 1000
Del.quantity cm³/: 0.0...7.0
1000H.: -
3rd speed 1/min: 1500
Charge press. hPa: 1000
Del.quantity cm³/: 13.5...21.5
1000H.: (10.5...24.5)
4th speed 1/min: 1450
Charge press. hPa: 1000
Del.quantity cm³/: 47.0...53.0
1000H.: (44.0...56.0)
5th speed 1/min: 1300
Charge press. hPa: 1000
Del.quantity cm³/: 95.0...98.0
1000H.: (93.5...99.5)
6th speed 1/min: 1000
Charge press. hPa: 1000
Del.quantity cm³/: 99.5...102.5
1000H.: (98.0...104.0)
7th speed 1/min: 700

Charge press. hPa: 1000
Del.quantity cm³/: 99.0...100.0
1000H.: (96.5...102.5)
8th speed 1/min: 700
Charge press. hPa: -
Del.quantity cm³/: 87.0...88.0
1000H.: (84.5...90.5)
9th speed 1/min: 500
Charge press. hPa: -
Del.quantity cm³/: 80.0...83.0
1000H.: (78.5...84.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1300
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 300
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 300
Del.quantity cm³/: 16.5...20.5
1000H.: (13.5...23.5)
2nd speed 1/min: 350
Del.quantity cm³/: 4.5...10.5
1000H.: (2.5...12.5)
3rd speed 1/min: 400
Del.quantity cm³/: 0.0...2.6
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 150
Charge press. hPa: -
Del.quantity cm³/: -
ind. 1000H: 95.0

2nd speed 1/min: 230
Charge press. hPa: -
Del.quantity cm³/: -
max. 1000H : 85.0

Shutoff electromagnet:

Cut-in
min. voltage : 20.0
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	K-OT
MS	mm	:	0.6...1.0
SVS max.	mm	:	3.2
XK	mm	:	17.0...19.0
XL	mm	:	12.8...16.2

Remarks:



BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER 6.0 C2
Compl. date: : -
Edition : 06.11.89
replaces : 03.02.89
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1300 R240-2
Type number : 0 460 426 094

Customer-specific information
Customer : PERKINS

Engine : T6 60 CC TRU

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C : -
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 020

Opening
pressure bar : 172...175

Perforated-plate
diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.25
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm : 1.0
mm : ± 0.02

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100

Charge press. hPa: 1000
Setting value mm: 1.3...1.7

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value bar: 6.5...7.1

Full-load del. with charge press.:

Speed 1/min: 700
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 99.0...100.0
Dispersion cm³/ : 5.0
1000H : -

Full-load del. w/out charge press.:

Speed 1/min : 700
Del.quantity cm³/
1000H.: 87.0...88.0

Low-idle speed regulation:

Speed 1/min: 300
Charge press. hPa: -
Del.quantity cm³/
1000H.: 16.5...20.5
Dispersion cm³/ : 5.0
1000H.: -

Full-load speed regulation:

Speed 1/min: 1450
Charge press. hPa: 1000
Del.quantity cm³/
1000H: 47.0...53.0

Start:

Speed 1/min: 100
Charge press. hPa: -
Del.quantity : -
mind cm³/1000H.: 120.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
Charge press. hPa: 1000
TD travel mm: 0.4...1.2
mm: (0.1...1.5)
2nd speed 1/min: 1100
Charge press. hPa: 1000

TD travel mm: 1.3...1.7
 mm: (0.8...2.2)
 3rd speed 1/min: 1300
 Charge press. hPa: 1000
 TD travel mm: 2.0...2.8
 mm: (1.7...3.1)

Supply-pump pressure characteristic:

1st speed 1/min: 500
 Charge press. hPa: 1000
 Supply-pump pressure bar: 3.9...4.5
 2nd speed 1/min: 1100
 Charge press. hPa: 1000
 Supply-pump pressure bar: 6.5...7.1
 3rd speed 1/min: 1300
 Charge press. hPa: 1000
 Supply-pump pressure bar: 7.3...7.9

Overflow quantity at overflow valve:

1st speed 1/min: 500
 Charge press. hPa: -
 Overflow : 41...83
 quantity cm³/10s: (26...98)
 2nd speed 1/min: 1300
 Charge press. hPa: 1000
 Overflow : 55...138
 quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
 Charge-air pressure-setting point hPa: 400
 LDA stroke mm: 6.3
 Del.quantity cm³/: 95.0...96.0
 1000H.: (92.5...98.5)
 2nd speed 1/min: 1550
 Charge press. hPa: 1000
 Del.quantity cm³/: 0.0...7.0
 1000H.: -
 3rd speed 1/min: 1500
 Charge press. hPa: 1000
 Del.quantity cm³/: 13.5...21.5
 1000H.: (10.5...24.5)
 4th speed 1/min: 1450
 Charge press. hPa: 1000
 Del.quantity cm³/: 47.0...53.0
 1000H.: (44.0...56.0)
 5th speed 1/min: 1300
 Charge press. hPa: 1000
 Del.quantity cm³/: 95.0...98.0
 1000H.: (93.5...99.5)
 6th speed 1/min: 1000
 Charge press. hPa: 1000

Del.quantity cm³/: 99.5...102.5
 1000H.: (98.0...104.0)
 7th speed 1/min: 700
 Charge press. hPa: 1000
 Del.quantity cm³/: 99.0...100.0
 1000H.: (96.5...102.5)
 8th speed 1/min: 700
 Charge press. hPa: -
 Del.quantity cm³/: 87.0...88.0
 1000H.: (84.5...90.5)
 9th speed 1/min: 500
 Charge press. hPa: -
 Del.quantity cm³/: 80.0...83.0
 1000H.: (78.5...84.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1300
 Del.quantity cm³/: 0..3
 1000H.: -

Idle delivery:

1st speed 1/min: 300
 Del.quantity cm³/: 16.5...20.5
 1000H.: (13.5...23.5)
 2nd speed 1/min: 350
 Del.quantity cm³/: 4.5...10.5
 1000H.: (2.5...12.5)
 3rd speed 1/min: 400
 Del.quantity cm³/: 0.0...2.6
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 150
 Charge press. hPa: -
 Del.quantity cm³/: -
 ind. 1000H: 95.0
 2nd speed 1/min: 230
 Charge press. hPa: -
 Del.quantity cm³/: -
 max. 1000H : 85.0

Shutoff electromagnet:

Cut-in
 min. voltage : -
 Rated voltage : -

Mounting and assembly dimensions:

Designation
 K mm : -
 KF mm : K-OT
 MS mm : 0.6...1.0
 SVS max. mm : -

XK mm : 17.0...19.0
XL mm : 12.8...16.2

Remarks:



BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 7,2 T
Edition : 06.11.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1350 R291-2
Type number : 0 460 426 134

Customer-specific information
Customer : MAN

Engine : D 0826 GF

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 020

Opening
pressure bar : 172...175

Perforated-plate
diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,35
(from BDC): $\pm 0,02(0,04)$

Indicator setting:
Piston stroke mm : 1.0
Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000
Charge press. hPa: -
Setting value mm: 3,1...3,5

Supply-pump pressure:

Speed 1/min: 1000
Setting value bar: 5,9...6,5

Full-load del. with charge press.:

Speed 1/min: 1000
Del.quantity cm³/
1000H.: 97,5...98,5
Dispersion cm³/
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 300
Del.quantity cm³/
1000H.: 19,0...25,0
Dispersion cm³/
1000H.: (4,0)

Full-load speed regulation:

Speed 1/min: 1400
Del.quantity cm³/
1000H.: 73,0...79,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 70,0

Load-dependent start of delivery:

Speed 1/min: 1000

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
TD travel mm: 0,9...1,7
mm: (0,6...2,0)
2nd speed 1/min: 1000
TD travel mm: 3,1...3,5
mm: (2,6...4,0)
3rd speed 1/min: 1100
TD travel mm: 4,0...4,8
mm: (3,7...5,1)

Supply-pump pressure characteristic:

1st speed 1/min: 600
Supply-pump
pressure bar: 3,9...4,5
2nd speed 1/min: 1000

Supply-pump
pressure bar: 5,9...6,5
3rd speed 1/min: 1350
Supply-pump
pressure bar: 7,5...8,1

Overflow quantity at overflow valve:

1st speed 1/min: 600
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1350
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1550
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1500
Del.quantity cm³/: 0,0...20,0
1000H.: -
3rd speed 1/min: 1450
Del.quantity cm³/: 20,0...60,0
1000H.: -
4th speed 1/min: 1400
Del.quantity cm³/: 73,0...79,0
1000H.: (71,5...80,5)
5th speed 1/min: 1350
Del.quantity cm³/: 93,5...96,5
1000H.: (92,0...98,0)
6th speed 1/min: 1000
Del.quantity cm³/: 97,5...98,5
1000H.: (95,5...100,5)
7th speed 1/min: 800
Del.quantity cm³/: 96,0...100,0
1000H.: (94,5...101,5)
8th speed 1/min: 600
Del.quantity cm³/: 93,0...97,0
1000H.: (91,5...98,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1350
Del.quantity cm³/: 0...3
1000H.: -

Electr. shutoff:

Speed 1/min: 300
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 300

Del.quantity cm³/: 19,0...25,0
1000H.: (17,0...27,0)
2nd speed 1/min: 450
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 250
Del.quantity cm³/: -
ind. 1000H.: 105,0
2nd speed 1/min: 400
Del.quantity cm³/: -
max. 1000H.: 110,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,1...5,5
MS	mm	: 0,8...1,2
SVS max.	mm	: 4,2
XK	mm	: 17,0...19,0
XL	mm	: 11,9...15,3

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 U35
Edition : 23.10.89
replaces : 10.07.89
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1000 R369
Type number : 0 460 426 138

Customer-specific information
Customer : CDC

Engine : 6 BT - 5.9 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm : 1.5
mm : $\pm 0.02(0.06)$

Outlet : 0

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3.0...3.4

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3.3...3.9

Full-load del. w/out charge press.:

Speed 1/min : 850
Del.quantity cm³/
1000H.: 63.0...64.0
Dispersion cm³/: 4.0
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 450
Del.quantity cm³/
1000H.: 4.0...10.0
Dispersion cm³/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1040
Del.quantity cm³/
1000H: 53.0...59.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 60.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1.2...2.0
mm: (0.9...2.3)
2nd speed 1/min: 750
TD travel mm: 3.0...3.4
mm: (2.5...3.9)
3rd speed 1/min: 1000
TD travel mm: 4.6...5.4
mm: (4.3...5.7)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.3...2.9
bar: (2.1...3.1)
2nd speed 1/min: 750
Supply-pump
pressure bar: 3.3...3.9
bar: (3.1...4.1)

3rd speed 1/min: 1000
Supply-pump
pressure bar: 4.5...5.1
bar: (4.3...5.3)

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1120
Del.quantity cm³/: 0.0...3.0
1000H.: (0.0...3.0)
2nd speed 1/min: 1100
Del.quantity cm³/: 0.0...15.0
1000H.: (0.0...15.0)
3rd speed 1/min: 1060
Del.quantity cm³/: 25.0...55.0
1000H.: (25.0...55.0)
4th speed 1/min: 1040
Del.quantity cm³/: 53.0...59.0
1000H.: (50.0...62.0)
5th speed 1/min: 1000
Del.quantity cm³/: 60.0...63.0
1000H.: (58.5...64.5)
6th speed 1/min: 850
Del.quantity cm³/: 63.0...64.0
1000H.: (60.5...66.5)
7th speed 1/min: 750
Del.quantity cm³/: 61.0...65.0
1000H.: (59.0...67.0)
8th speed 1/min: 500
Del.quantity cm³/: 38.5...46.5
1000H.: (36.5...48.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1000
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 450
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 450

Del.quantity cm³/: 4.0...10.0
1000H.: (2.0...12.0)
2nd speed 1/min: 500
Del.quantity cm³/: 0.0...4.0
1000H.: (0.0...4.0)

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H: 70.0
2nd speed 1/min: 240
Del.quantity cm³/: -
max. 1000H : 35.0

Shutoff electromagnet:

Cut-in
min. voltage : 20.0
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5.0...5.4
MS	mm	: 0.8...1.2
SVS max.	mm	: 1.2
XK	mm	: 18.8...20.8
XL	mm	: 9.9...13.3

Remarks:

: C.D.C. # 391 7563

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CAS 5,9 G
Edition : 07.11.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R371
Type number : 0 460 426 140

Customer-specific information
Customer : CASE

Engine : 6 BT-5.9IND

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,2
(from BDC): $\pm 0,02(0,04)$

Start of delivery block
Piston stroke mm : 1,5
mm : $\pm 0,02(0,06)$

Outlet : 0

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 2,6...3,0

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 4,9...5,5

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm³/
1000H.: 58,5...59,5
Dispersion cm³/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 400
Del.quantity cm³/
1000H.: 8,0...12,0
Dispersion cm³/: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1160
Del.quantity cm³/
1000H: 41,0...47,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 35,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 0,6...1,4
mm: (0,3...1,7)
2nd speed 1/min: 750
TD travel mm: 2,6...3,0
mm: (2,1...3,5)
3rd speed 1/min: 1100
TD travel mm: 5,0...5,8
mm: (4,7...6,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 3,8...3,4
2nd speed 1/min: 750
Supply-pump
pressure bar: 4,9...5,5
3rd speed 1/min: 1100

Supply-pump
pressure bar: 6,4...7,0

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1100
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1210
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1180
Del.quantity cm³/: 15,0...55,0
1000H.: -
3rd speed 1/min: 1160
Del.quantity cm³/: 41,0...47,0
1000H.: (38,0...50,0)
4th speed 1/min: 1100
Del.quantity cm³/: 55,5...58,5
1000H.: (54,0...60,0)
5th speed 1/min: 900
Del.quantity cm³/: 57,5...60,5
1000H.: (56,0...62,0)
6th speed 1/min: 750
Del.quantity cm³/: 58,5...59,5
1000H.: (56,0...62,0)
7th speed 1/min: 500
Del.quantity cm³/: 50,5...58,5
1000H.: -

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0...3
1000H.: -

Electr. shutoff:

Speed 1/min: 400
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 400
Del.quantity cm³/: 8,0...12,0
1000H.: (5,0...15,0)
2nd speed 1/min: 450
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 220
Del.quantity cm³/: -
ind. 1000H.: 45,0

2nd speed 1/min: 420
Del.quantity cm³/: -
max. 1000H.: 70,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,0...5,4
MS mm : 0,8...1,2
SVS max. mm : 4,5
XK mm : 18,8...20,8
XL mm : 11,3...14,7

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W6
Edition : 20.10.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1150 R373/1
Type number : 0 460 426 144

Customer-specific information
Customer : CDC

Engine : 6 BT - 5.9 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm : 1.85
mm: $\pm 0.02(0.06)$
Outlet : 0

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Charge press. hPa: 1000

J05

Setting value mm: 1.6...2.0

Supply-pump pressure:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value bar: 3.3...3.9

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 82.5...84.5
Dispersion cm3/ : 4.0
1000H : (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 67.5...68.5
Dispersion cm3/ : 9.0
1000H.: -

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: -
Del.quantity cm3/
1000H.: 9.0...13.0
Dispersion cm3/ : 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1200
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 64.0...70.0

Start:

Speed 1/min: 100
Charge press. hPa: -
Del.quantity : -
mind cm3/1000H.: 70.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600
Charge press. hPa: 1000
TD travel mm: 0.5...1.3
mm: (0.2...1.6)
2nd speed 1/min: 750
Charge press. hPa: 1000

TD travel mm: 1.6...2.0
mm: (1.1...2.5)
3rd speed 1/min: 1150
Charge press. hPa: 1000
TD travel mm: 2.8...3.6
mm: (2.5...3.9)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 2.6...3.2
bar: (2.4...3.4)
2nd speed 1/min: 750
Charge press. hPa: 1000
Supply-pump pressure bar: 3.3...3.9
bar: (3.1...4.1)
3rd speed 1/min: 1150
Charge press. hPa: 1000
Supply-pump pressure bar: 4.9...5.5
bar: (4.7...5.7)

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow quantity cm³/10s: 41...83
2nd speed 1/min: 1150
Charge press. hPa: 1000
Overflow quantity cm³/10s: 55...138
40...153

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
Charge-air pressure-setting point hPa: 400
Del.quantity cm³/: 77.5...78.5
1000H.: (73.5...82.5)
2nd speed 1/min: 1300
Charge press. hPa: 1000
Del.quantity cm³/: 0.0...3.0
1000H.: (0.0...3.0)
3rd speed 1/min: 1230
Charge press. hPa: 1000
Del.quantity cm³/: 15.0...55.0
1000H.: (15.0...55.0)
4th speed 1/min: 1200
Charge press. hPa: 1000
Del.quantity cm³/: 64.0...70.0
1000H.: (61.0...73.0)
5th speed 1/min: 1150
Charge press. hPa: 1000
Del.quantity cm³/: 76.0...79.0
1000H.: (74.5...80.5)
6th speed 1/min: 900

Charge press. hPa: 1000
Del.quantity cm³/: 81.0...84.0
1000H.: (79.5...85.5)
7th speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/: 82.5...83.5
1000H.: (80.0...86.0)
8th speed 1/min: 500
Charge press. hPa: 1000
Del.quantity cm³/: 82.0...90.0
1000H.: -
9th speed 1/min: 5000
Charge press. hPa: -
Del.quantity cm³/: 67.5...68.5
1000H.: (63.5...72.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1150
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 9.0...13.0
1000H.: (6.0...16.0)
2nd speed 1/min: 500
Del.quantity cm³/: 0.0...4.0
1000H.: (0.0...4.0)

Automatic starting fuel delivery:

1st speed 1/min: 280
Charge press. hPa: -
Del.quantity cm³/: -
ind. 1000H.: 75.0

2nd speed 1/min: 440
Charge press. hPa: -
Del.quantity cm³/: -
max. 1000H.: 80.0

Shutoff electromagnet:

Cut-in min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5.0...5.4
MS	mm	:	1.0...1.4
SVS max.	mm	:	1.6

Remarks:

: C.D.C. # 391 6894

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 U36
Edition : 23.10.89
replaces : 10.07.89
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1050 R373-2
Type number : 0 460 426 145

Customer-specific information
Customer : CDC

Engine : 6 BTA - 5.9 IND.

Power k: 118
Speed 1/mi: 2100

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.85
mm: $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value mm: 1.5...1.9

Supply-pump pressure:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value bar: 2.9...3.5

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 94.5...95.5
Dispersion cm³/ : 4.0
1000H.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 50.5...51.5
Dispersion cm³/ : 9.0
1000H.: -

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: -
Del.quantity cm³/
1000H.: 8.0...12.0
Dispersion cm³/ : 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 73.0...79.0

Start:

Speed 1/min: 100
Charge press. hPa: -
Del.quantity : -
mind cm³/1000H.: 60.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600
Charge press. hPa: 1000

TD travel mm: 0.5...1.4
mm: (0.2...1.6)
2nd speed 1/min: 750
Charge press. hPa: 1000
TD travel mm: 1.5...1.9
mm: (1.0...2.4)
3rd speed 1/min: 1050
Charge press. hPa: 1000
TD travel mm: 2.5...3.4
mm: (2.2...3.6)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 1.8...2.4
bar: (1.6...2.6)
2nd speed 1/min: 750
Charge press. hPa: 1000
Supply-pump pressure bar: 2.9...3.5
bar: (2.7...3.7)
3rd speed 1/min: 1050
Charge press. hPa: 1000
Supply-pump pressure bar: 4.3...4.9
bar: (4.1...5.1)

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1050
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
Charge-air pressure-setting point hPa: 300
Del.quantity cm³/: 79.5...80.5
1000H.: (75.5...84.5)
2nd speed 1/min: 1200
Charge press. hPa: 1000
Del.quantity cm³/: 0.0...3.0
1000H.: (0.0...3.0)
3rd speed 1/min: 1140
Charge press. hPa: 1000
Del.quantity cm³/: 15.0...55.0
1000H.: (15.0...55.0)
4th speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm³/: 73.0...79.0
1000H.: (70.0...82.0)
5th speed 1/min: 1050

Charge press. hPa: 1000
Del.quantity cm³/: 83.5...86.5
1000H.: (82.0...88.0)
6th speed 1/min: 900
Charge press. hPa: 1000
Del.quantity cm³/: 87.5...90.5
1000H.: (86.0...92.0)
7th speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/: 94.5...95.5
1000H.: (92.0...98.0)
8th speed 1/min: 500
Charge press. hPa: 1000
Del.quantity cm³/: 98.0...106.0
1000H.: -
9th speed 1/min: 500
Charge press. hPa: -
Del.quantity cm³/: 50.5...51.5
1000H.: (46.5...55.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1050
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 8.0...12.0
1000H.: (5.0...15.0)
2nd speed 1/min: 500
Del.quantity cm³/: 0.0...4.0
1000H.: (0.0...4.0)

Automatic starting fuel delivery:

1st speed 1/min: 250
Charge press. hPa: -
Del.quantity cm³/: -
ind. 1000H: 45.0

2nd speed 1/min: 450
Charge press. hPa: -
Del.quantity cm³/: -
max. 1000H : 55.0

Shutoff electromagnet:

Cut-in
min. voltage : 20.0

Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5.0...5.4
MS	mm	:	1.2...1.6
SVS max.	mm	:	1.2

Remarks:

: C.D.C. # 391 7000

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W4
Edition : 20.10.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1325 R367-1
Type number : 0 460 426 146

Customer-specific information
Customer : CDC

Engine : 6 BT 5.9 IND.

Power k: 97
Speed 1/mi: 2650

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.5
mm: $\pm 0.02(0.06)$

Outlet : 0

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 850
Setting value mm: 3.9...4.3

Supply-pump pressure:

Speed 1/min: 850
Setting value bar: 3.9...4.5

Full-load del. w/out charge press.:

Speed 1/min : 1100
Del.quantity cm3/
1000H.: 56.0...57.0
Dispersion cm3/: 4.0
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 8.0...14.0
Dispersion cm3/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1400
Del.quantity cm3/
1000H.: 36.0...42.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 60.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1.3...2.1
mm: (1.0...2.4)
2nd speed 1/min: 850
TD travel mm: 3.9...4.3
mm: (3.4...4.8)
3rd speed 1/min: 1100
TD travel mm: 5.9...6.7
mm: (5.6...7.0)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.5...3.1
bar: (2.3...3.3)
2nd speed 1/min: 850

Supply-pump
pressure bar: 3.9...4.5
bar: (3.7...4.7)
3rd speed 1/min: 1100
Supply-pump
pressure bar: 4.9...5.5
bar: (4.7...5.7)

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1325
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1520
Del.quantity cm³/: 0.0...3.0
1000H.: (0.0...3.0)
2nd speed 1/min: 1440
Del.quantity cm³/: 15.0...45.0
1000H.: (15.0...45.0)
3rd speed 1/min: 1400
Del.quantity cm³/: 36.0...42.0
1000H.: (33.0...45.0)
4th speed 1/min: 1325
Del.quantity cm³/: 52.5...55.5
1000H.: (51.0...57.0)
5th speed 1/min: 1100
Del.quantity cm³/: 56.0...57.0
1000H.: (53.5...59.5)
6th speed 1/min: 850
Del.quantity cm³/: 53.5...57.5
1000H.: (51.5...59.5)
7th speed 1/min: 500
Del.quantity cm³/: 38.5...46.5
1000H.: (36.5...48.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1325
Del.quantity cm³/: 0...3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375

Del.quantity cm³/: 8.0...14.0
1000H.: (6.0...16.0)
2nd speed 1/min: 450
Del.quantity cm³/: 0.0...4.0
1000H.: (0.0...4.0)

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H.: 65.0

2nd speed 1/min: 250
Del.quantity cm³/: -
max. 1000H.: 65.0

Shutoff electromagnet:

Cut-in
min. voltage : 20.0
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5.0...5.4
MS	mm	:	1.3...1.7
SVS max.	mm	:	1.3

Remarks:

: C.D.C. # 391 6904

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 U45
Edition : 23.10.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R373/3
Type number : 0 460 426 149

Customer-specific information
Customer : CDC

Engine : 6 BTA - 590

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 688 901 027

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm : 1.85
mm : $\pm 0.02(0.06)$

Outlet : 0

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Charge press. hPa: 1000

Setting value mm: 1.4...1.8

Supply-pump pressure:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value bar: 3.2...3.8

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 82.0...83.0
Dispersion cm³/
1000H : (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 40.0...41.0

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: -
Del.quantity cm³/
1000H.: 4.0...8.0
Dispersion cm³/
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1300
Charge press. hPa: 1000
Del.quantity cm³/
1000H: 65.0...71.0

Start:

Speed 1/min: 100
Charge press. hPa: -
Del.quantity : -
mind cm³/1000H.: 70.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600
Charge press. hPa: 1000
TD travel mm: 0.4...1.2
mm: (0.1...1.5)
2nd speed 1/min: 750
Charge press. hPa: 1000
TD travel mm: 1.4...1.8
mm: (0.9...2.3)

3rd speed 1/min: 1050
Charge press. hPa: 1000
TD travel mm: 2.3...3.1
mm: (2.0...3.4)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 2.1...2.7
bar: (1.9...2.9)
2nd speed 1/min: 750
Charge press. hPa: 1000
Supply-pump pressure bar: 3.2...3.8
bar: (3.0...4.0)
3rd speed 1/min: 1050
Charge press. hPa: 1000
Supply-pump pressure bar: 4.3...4.9
bar: (4.1...5.1)

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1250
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
Charge-air pressure-setting point hPa: 450
Del.quantity cm³/: 67.0...68.0
1000H.: (63.0...72.0)
2nd speed 1/min: 1400
Charge press. hPa: 1000
Del.quantity cm³/: 0.0...3.0
1000H.: (0.0...3.0)
3rd speed 1/min: 1330
Charge press. hPa: 1000
Del.quantity cm³/: 15.0...55.0
1000H.: (15.0...55.0)
4th speed 1/min: 1300
Charge press. hPa: 1000
Del.quantity cm³/: 65.0...71.0
1000H.: (62.0...74.0)
5th speed 1/min: 1250
Charge press. hPa: 1000
Del.quantity cm³/: 73.5...76.5
1000H.: (72.0...78.0)
6th speed 1/min: 1050
Charge press. hPa: 1000

Del.quantity cm³/: 78.0...81.0
1000H.: (76.5...82.5)
7th speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/: 82.0...83.0
1000H.: (79.5...85.5)
8th speed 1/min: 500
Charge press. hPa: 1000
Del.quantity cm³/: 82.0...90.0
1000H.: -
9th speed 1/min: 500
Charge press. hPa: -
Del.quantity cm³/: 40.0...41.0
1000H.: (36.5...44.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm³/: 0..3
1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 4.0...8.0
1000H.: (1.0...11.0)
2nd speed 1/min: 500
Del.quantity cm³/: 0.0...4.0
1000H.: (0.0...4.0)

Automatic starting fuel delivery:

1st speed 1/min: 200
Del.quantity cm³/: -
ind. 1000H: 60.0
2nd speed 1/min: 370
Del.quantity cm³/: -
max. 1000H : 60.0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5.0...5.4
MS	mm	:	1.2...1.6
SVS max.	mm	:	2.2

Remarks:

: C.D.C. # 391 7038
Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 U46
Edition : 23.10.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R373-4
Type number : 0 460 426 150

Customer-specific information
Customer : CDC

Engine : 6 BTA - 590

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm : 1.85
mm : $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Charge press. hPa: 1000

Setting value mm: 1.4...1.8

Supply-pump pressure:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value bar: 3.2...3.8

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 82.0...83.0
Dispersion cm³/
1000H.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 40.0...41.0

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: -
Del.quantity cm³/
1000H.: 4.0...8.0
Dispersion cm³/
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1300
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 65.0...71.0

Start:

Speed 1/min: 100
Charge press. hPa: -
Del.quantity : -
mind cm³/1000H.: 70.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600
Charge press. hPa: 1000
TD travel mm: 0.4...1.2
mm: (0.1...1.5)
2nd speed 1/min: 750
Charge press. hPa: 1000
TD travel mm: 1.4...1.8
mm: (0.9...2.3)

3rd speed 1/min: 1050
Charge press. hPa: 1000
TD travel mm: 2.3...3.1
mm: (2.0...3.4)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 2.1...2.7
bar: (1.9...2.9)
2nd speed 1/min: 750
Charge press. hPa: 1000
Supply-pump pressure bar: 3.2...3.8
bar: (3.0...4.0)
3rd speed 1/min: 1050
Charge press. hPa: 1000
Supply-pump pressure bar: 4.3...4.9
bar: (4.1...5.1)

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow quantity cm³/10s: 41...83
(26...98)
2nd speed 1/min: 1250
Charge press. hPa: 1000
Overflow quantity cm³/10s: 55...138
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
Charge-air pressure-setting point hPa: 450
Del.quantity cm³/: 67.0...68.0
1000H.: (63.5...71.5)
2nd speed 1/min: 1400
Charge press. hPa: 1000
Del.quantity cm³/: 0.0...3.0
1000H.: (0.0...3.0)
3rd speed 1/min: 1330
Charge press. hPa: 1000
Del.quantity cm³/: 15.0...55.0
1000H.: (15.0...55.0)
4th speed 1/min: 1300
Charge press. hPa: 1000
Del.quantity cm³/: 65.0...71.0
1000H.: (62.0...74.0)
5th speed 1/min: 1250
Charge press. hPa: 1000
Del.quantity cm³/: 73.5...76.5
1000H.: (72.0...78.0)
6th speed 1/min: 1050
Charge press. hPa: 1000

Del.quantity cm³/: 78.0...81.0
1000H.: (76.5...82.5)
7th speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/: 82.0...83.0
1000H.: (79.5...85.5)
8th speed 1/min: 500
Charge press. hPa: 1000
Del.quantity cm³/: 82.0...90.0
1000H.: -
9th speed 1/min: 500
Charge press. hPa: -
Del.quantity cm³/: 40.0...41.0
1000H.: (36.0...45.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm³/: 0...3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 4.0...8.0
1000H.: (1.0...11.0)
2nd speed 1/min: 500
Del.quantity cm³/: 0.0...4.0
1000H.: (0.0...4.0)

Automatic starting fuel delivery:

1st speed 1/min: 200
Del.quantity cm³/: -
ind. 1000H: 60.0
2nd speed 1/min: 370
Del.quantity cm³/: -
max. 1000H: 60.0

Shutoff electromagnet:

Cut-in
min. voltage : 20.0
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K mm : -
KF mm : 5.0...5.4

MS mm : 1.2...1.6
SVS max. mm : 2.2

Remarks:

: C.D.C. # 391 7037

Operate control lever after each
manifold-pressure compensator pressure
change.

* Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W7
Edition : 24.10.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R373-5

Customer-specific information
Customer : CDC

Engine : 6 BT - 5.9 IND.

Power k: 127.0
Speed 1/mi: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.85
mm: $\pm 0.02(0.06)$

Outlet : 0

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value mm: 1.3...1.7

Supply-pump pressure:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value bar: 3.2...3.8

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 83.0...84.0
Dispersion cm³/ : 4.0
1000H.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 67.5...68.5
Dispersion cm³/ : 9.0
1000H.: -

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm³/
1000H.: 9.0...13.0
Dispersion cm³/ : 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1150
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 60.0...66.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 80.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600
Charge press. hPa: 1000
TD travel mm: 0.4...1.2
mm: (0.1...1.5)
2nd speed 1/min: 750
Charge press. hPa: 1000

TD travel mm: 1.3...1.7
mm: (0.8...2.2)
3rd speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: 2.2...3.0
mm: (1.9...3.3)

Supply-pump pressure characteristic:

1st speed 1/min: 600
Charge press. hPa: 1000
Supply-pump pressure bar: 2.6...3.2
bar: (2.4...3.4)
2nd speed 1/min: 750
Charge press. hPa: 1000
Supply-pump pressure bar: 3.2...3.8
bar: (3.0...4.0)
3rd speed 1/min: 1100
Charge press. hPa: 1000
Supply-pump pressure bar: 4.7...5.3
bar: (4.5...5.5)

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow quantity cm³/10s: 41...83
(26...98)
2nd speed 1/min: 1100
Charge press. hPa: 1000
Overflow quantity cm³/10s: 55...138
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
Charge-air pressure-setting point hPa: 400
Del.quantity cm³/: 77.5...78.5
1000H.: (73.5...82.5)
2nd speed 1/min: 1260
Charge press. hPa: 1000
Del.quantity cm³/: 0.0...3.0
1000H.: (0.0...3.0)
3rd speed 1/min: 1200
Charge press. hPa: 1000
Del.quantity cm³/: 15.0...55.0
1000H.: (15.0...55.0)
4th speed 1/min: 1150
Charge press. hPa: 1000
Del.quantity cm³/: 60.0...66.0
1000H.: (57.0...69.0)
5th speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm³/: 78.5...81.5
1000H.: (77.0...83.0)
6th speed 1/min: 900

Charge press. hPa: 1000
Del.quantity cm³/: 80.5...83.5
1000H.: (79.0...85.0)
7th speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/: 83.0...84.0
1000H.: (80.5...86.5)
8th speed 1/min: 500
Charge press. hPa: 1000
Del.quantity cm³/: 81.0...89.0
1000H.: -
9th speed 1/min: 500
Charge press. hPa: -
Del.quantity cm³/: 67.5...68.5
1000H.: (63.5...72.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0...3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 9.0...13.0
1000H.: (6.0...16.0)
2nd speed 1/min: 500
Del.quantity cm³/: 0.0...4.0
1000H.: (0.0...4.0)

Automatic starting fuel delivery:

1st speed 1/min: 280
Del.quantity cm³/: -
ind. 1000H: 80.0
2nd speed 1/min: 440
Del.quantity cm³/: -
max. 1000H : 80.0

Shutoff electromagnet:

Cut-in min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation K mm : -

KF mm : 5.0...5.4
MS mm : 1.0...1.4
SVS max. mm : -

Remarks: : C.D.C. # 391 6910

Operate control lever after each
manifold-pressure compensator pressure
change.

* Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9W12
Edition : 14.11.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R381-1
Type number : 0 460 426 153

Customer-specific information
Customer : CDC

Engine : 6 BT-5.9 IND.

Power k: 104
Speed 1/mi: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02(0,04)$

Start of delivery block
Piston stroke mm : 1,5
mm: $\pm 0,02(0,06)$
Outlet : 0

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm³/
1000H.: 71,5...72,5
Dispersion cm³/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm³/
1000H.: 8,0...14,0
Dispersion cm³/: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1140
Del.quantity cm³/
1000H.: 53,0...59,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 60,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,5...2,3
mm: (1,2...2,7)
2nd speed 1/min: 750
TD travel mm: 3,4...3,8
mm: (2,9...4,3)
3rd speed 1/min: 1100
TD travel mm: 5,2...6,0
mm: (4,9...6,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2,4...3,0
2nd speed 1/min: 750

Supply-pump
pressure bar: 3,5...4,1
3rd speed 1/min: 1100
Supply-pump
pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1100
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1220
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1160
Del.quantity cm³/: 15,0...45,0
1000H.: -
3rd speed 1/min: 1140
Del.quantity cm³/: 53,0...59,0
1000H.: (50,0...62,0)
4th speed 1/min: 1100
Del.quantity cm³/: 66,5...69,5
1000H.: (65,0...71,0)
5th speed 1/min: 900
Del.quantity cm³/: 71,5...72,5
1000H.: (69,0...75,0)
6th speed 1/min: 750
Del.quantity cm³/: 70,5...74,5
1000H.: (68,5...76,5)
7th speed 1/min: 500
Del.quantity cm³/: 56,0...64,0
1000H.: (54,0...66,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0...3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: 24,0
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 8,0...14,0
1000H.: (6,0...16,0)
2nd speed 1/min: 450

Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H.: 60,0

2nd speed 1/min: 240
Del.quantity cm³/: -
max. 1000H.: 60,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,0...5,4
MS	mm	: 0,8...1,2
SVS max.	mm	: 1,4

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W8
Edition : 25.10.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R381-2
Type number : 0 460 426 154

Customer-specific information
Customer : CDC

Engine : 6 BT - 5.9 IND.

Power k: 89.0
Speed 1/mi: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm : 1.5
mm: $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3.4...3.8

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3.5...4.1

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm³/
1000H.: 62.0...63.0
Dispersion cm³/: 4.0
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm³/
1000H.: 10.0...12.0
Dispersion cm³/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1150
Del.quantity cm³/
1000H.: 39.0...45.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 70.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1.5...2.3
mm: (1.2...2.6)
2nd speed 1/min: 750
TD travel mm: 3.4...3.8
mm: (2.9...4.3)
3rd speed 1/min: 1100
TD travel mm: 5.6...6.4
mm: (5.3...6.7))

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.4...3.0
2nd speed 1/min: 750

Supply-pump
pressure bar: 3.5...4.1
3rd speed 1/min: 1100
Supply-pump
pressure bar: 4.8...5.4

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1100
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1250
Del.quantity cm³/: 0.0...3.0
1000H.: (0.0...3.0)
2nd speed 1/min: 1170
Del.quantity cm³/: 15.0...55.0
1000H.: (15.0...55.0)
3rd speed 1/min: 1150
Del.quantity cm³/: 39.0...45.0
1000H.: (36.0...48.0)
4th speed 1/min: 1100
Del.quantity cm³/: 59.0...62.0
1000H.: (57.5...63.5)
5th speed 1/min: 900
Del.quantity cm³/: 61.5...64.5
1000H.: (59.5...66.5)
6th speed 1/min: 750
Del.quantity cm³/: 62.0...63.0
1000H.: (59.5...65.5)
7th speed 1/min: 500
Del.quantity cm³/: 57.0...65.0
1000H.: -

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 10...12
1000H.: (6.0...16.0)
2nd speed 1/min: 500

Del.quantity cm³/: 0.0...4.0
1000H.: (0.0...4.0)

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H.: 70.0

2nd speed 1/min: 300
Del.quantity cm³/: -
max. 1000H.: 80.0

Shutoff electromagnet:

Cut-in
min. voltage : 20.0
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5.0...5.4
MS mm : 1.2...1.6
SVS max. mm : -

Remarks:

:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W13
Edition : 15.11.89
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 6/12F1100 R381-3
Type number : 0 460 426 155

Customer-specific information
Customer : CDC

Engine : 6 BT - 5.9 IND.

Power k: 105
Speed 1/mi: 2100

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.5
mm: $\pm 0.02(0.06)$

Outlet : 0

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3.4...3.8

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3.7...4.3

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm3/
1000H.: 75,0...76,0
Dispersion cm3/: 4.0
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 10.0...12.0
Dispersion cm3/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1100
Del.quantity cm3/
1000H.: 52.0...58.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 60.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1.3...2.1
mm: (1.0...2.4)
2nd speed 1/min: 750
TD travel mm: 3.4...3.8
mm: (2.9...4.3)
3rd speed 1/min: 1050
TD travel mm: 5.0...5,8
mm: (4,7...6,1))

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.6...3.2
2nd speed 1/min: 750

Supply-pump
pressure bar: 3.7...4.3
3rd speed 1/min: 1050
Supply-pump
pressure bar: 4.9...5.5

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1050
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1200
Del.quantity cm³/: 0.0...3.0
1000H.: (0.0...3.0)
2nd speed 1/min: 1130
Del.quantity cm³/: 15.0...45.0
1000H.: -
3rd speed 1/min: 1100
Del.quantity cm³/: 52.0...58.0
1000H.: (49.0...61.0)
4th speed 1/min: 1050
Del.quantity cm³/: 69,5...72,5
1000H.: (68,0...74,0)
5th speed 1/min: 900
Del.quantity cm³/: 72,5...75,5
1000H.: (70,5...77,5)
6th speed 1/min: 750
Del.quantity cm³/: 75,0...76,0
1000H.: (72,5...78,5)
7th speed 1/min: 500
Del.quantity cm³/: 61,5...69,5
1000H.: (59,5...71,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1050
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 10,0...12,
1000H.: (6.0...16.0)
2nd speed 1/min: 450

Del.quantity cm³/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H.: 60.0

2nd speed 1/min: 240
Del.quantity cm³/: -
max. 1000H.: 60.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5.0...5.4
MS mm : 0,8...1.2
SVS max. mm : -

Remarks:

:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W14
Edition : 15.11.89
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 6/12F1100 R381-4
Type number : 0 460 426 156

Customer-specific information
Customer : CDC

Engine : 6 BT-5.9 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02(0,04)

Start of delivery block
Piston stroke mm: 1,5
mm: +0,02(0,06)

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Setting value mm: 4,2...4,6

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 4,7...5,3

Full-load del. w/out charge press.:

Speed 1/min : 1000
Del.quantity cm3/
1000H.: 67,0...68,0
Dispersion cm3/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 400
Del.quantity cm3/
1000H.: 11,0...13,0
Dispersion cm3/: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1150
Del.quantity cm3/
1000H.: 44,3...50,3

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 70,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 2,9...3,7
mm: (2,6...4,0)
2nd speed 1/min: 900
TD travel mm: 4,2...4,6
mm: (3,7...5,1)
3rd speed 1/min: 1100
TD travel mm: 5,5...6,3
mm: (5,2...6,6)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2,9...3,5
2nd speed 1/min: 750
Supply-pump
pressure bar: 4,0...4,6
3rd speed 1/min: 900

Supply-pump
pressure bar: 4,7...5,3
4th speed 1/min: 1100
Supply-pump
pressure bar: 5,5...6,1

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1100
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1240
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1180
Del.quantity cm³/: 15,0...55,0
1000H.: -
3rd speed 1/min: 1150
Del.quantity cm³/: 44,3...50,3
1000H.: (41,3...53,3)
4th speed 1/min: 1100
Del.quantity cm³/: 64,5...67,5
1000H.: (63,0...69,0)
5th speed 1/min: 1000
Del.quantity cm³/: 67,0...68,0
1000H.: (64,5...70,5)
6th speed 1/min: 750
Del.quantity cm³/: 83,0...87,0
1000H.: (81,0...89,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 400
ELAB volt: -
Del.quantity cm³/: 0,0...3,0

Idle delivery:

1st speed 1/min: 400
Del.quantity cm³/: 11,0...13,0
1000H.: (7,0...17,0)
2nd speed 1/min: 500
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H: 80,0

2nd speed 1/min: 250
Del.quantity cm³/: -
max. 1000H : 100,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,0...5,4
MS	mm	:	1,3...1,7
SVS max.	mm	:	2,2

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W15
Edition : 15.11.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R381-5
Type number : 0 460 426 157

Customer-specific information
Customer : CDC

Engine : 6 BT-5.9 IND.

Power k: 94
Speed 1/mi: 2100

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02(0,04)$

Start of delivery block
Piston stroke mm : 1,5
mm : $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

K01

Speed 1/min: 750
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm³/
1000H.: 64,5...65,5
Dispersion cm³/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm³/
1000H.: 10,0...12,0
Dispersion cm³/: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1100
Del.quantity cm³/
1000H.: 46,0...52,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 70,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,5...2,3
mm: (1,2...2,6)
2nd speed 1/min: 750
TD travel mm: 3,4...3,8
mm: (2,9...4,3)
3rd speed 1/min: 1050
TD travel mm: 5,0...5,8
mm: (4,7...6,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2,4...3,0
2nd speed 1/min: 750

Supply-pump
pressure bar: 3,5...4,1
3rd speed 1/min: 1050
Supply-pump
pressure bar: 4,6...5,2

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1050
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1250
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1130
Del.quantity cm³/: 15,0...55,0
1000H.: -
3rd speed 1/min: 1100
Del.quantity cm³/: 46,0...52,0
1000H.: (43,0...55,0)
4th speed 1/min: 1050
Del.quantity cm³/: 60,5...63,5
1000H.: (59,0...65,0)
5th speed 1/min: 900
Del.quantity cm³/: 62,0...65,0
1000H.: (60,0...67,0)
6th speed 1/min: 750
Del.quantity cm³/: 64,5...65,5
1000H.: (62,0...68,0)
7th speed 1/min: 500
Del.quantity cm³/: 64,0...72,0
1000H.: -

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1050
Del.quantity cm³/: 0...3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0,0...3,0

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 10,0...12,0
1000H.: (6,0...16,0)
2nd speed 1/min: 500

Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H.: 70,0

2nd speed 1/min: 350
Del.quantity cm³/: -
max. 1000H.: 70,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,0...5,4
MS mm : 1,2...1,6

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 1,7A
Edition : 09.11.89
replaces : 04.11.87
Calibrating oil : ISO 4113

Injection pump : VE 4/ 8F2300 R171
Type number : 0 460 484 010

Customer-specific information
Customer : PEUGEOT

Engine : XUD7

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : -
(from BDC): -

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 1250
Setting value bar: 4,3...4,9

Full-load del. w/out charge press.:

Speed 1/min: 1250
Del.quantity cm3/
1000H.: 28,0...29,0
Dispersion cm3/: 2,5
1000H.: -

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 8,0...12,0
Dispersion cm3/: 2,0
1000H.: (3,0)

Residual-Delivery Setting

Speed 1/min: 550
Del.quantity cm3/
1000H.: 3,5...4,5

Full-load speed regulation:

Speed 1/min: 2440
Del.quantity cm3/
1000H.: 19,0...25,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 42,0

Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
TD travel mm: 0,8...1,6
mm: (0,5...1,9)
2nd speed 1/min: 1250
TD travel mm: 3,4...3,8
mm: (3,1...4,1)
3rd speed 1/min: 2000
TD travel mm: 7,5...8,3
mm: (7,2...8,6)

Supply-pump pressure characteristic:

1st speed 1/min: 800
Supply-pump
pressure bar: 3,0...3,6
2nd speed 1/min: 1250
Supply-pump
pressure bar: 4,3...4,9
3rd speed 1/min: 2000

Supply-pump
pressure bar: 6,4...7,0

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 2250
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2690
Del.quantity cm³/: 4,0...10,0
1000H.: (3,5...10,5)
2nd speed 1/min: 2540
Del.quantity cm³/: 11,5...17,5
1000H.: (10,0...19,0)
3rd speed 1/min: 2440
Del.quantity cm³/: 19,0...25,0
1000H.: (18,0...26,0)
4th speed 1/min: 2250
Del.quantity cm³/: 27,0...29,0
1000H.: (25,7...30,3)
5th speed 1/min: 2000
Del.quantity cm³/: 27,5...29,5
1000H.: (26,2...30,8)
6th speed 1/min: 1250
Del.quantity cm³/: 28,0...29,0
1000H.: (26,2...30,8)
7th speed 1/min: 800
Del.quantity cm³/: 28,0...30,0
1000H.: (26,0...32,0)
8th speed 1/min: 500
Del.quantity cm³/: 28,0...31,0
1000H.: (26,5...32,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 2250
Del.quantity cm³/: 0...3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 8,0...12,0
1000H.: (6,0...14,0)

High Idle:

Speed 1/min: 450
Del.quantity cm³/: 8,0...12,0
1000H.: (6,0...14,0)

Residual:

Speed 1/min: 550
Del.quantity : 3,5...4,5
1000H.: (2,5...5,5)

Automatic starting fuel delivery:

1st speed 1/min: 200
Del.quantity cm³/: -
ind. 1000H: 34,0

2nd speed 1/min: 300
Del.quantity cm³/: -
max. 1000H : 64,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : 3,2...3,4
KF mm : 5,2...5,5
MS mm : 1,3...1,5
SVS max. mm : 3,0
XK mm : 18,9...20,9
XL mm : 12,2...15,6

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VW 1,4 A
Edition : 08.11.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4 /8F2450 L331-2
Type number : 0 460 484 033

Customer-specific information
Customer : VW

Engine : 031.2

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C : -
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : -
(from BDC) : -

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250
Setting value mm: 2,8...3,2

Supply-pump pressure:

Speed 1/min: 1250
Setting value bar: 4,9...5,5

Full-load del. w/out charge press.:

Speed 1/min: 1500
Del.quantity cm³/
1000H.: 24,3...25,3

Low-idle speed regulation:

Speed 1/min: 425
Del.quantity cm³/
1000H.: 9,5...11,5

Residual-Delivery Setting

Speed 1/min: 575
Del.quantity cm³/
1000H.: 2,5...3,5

Full-load speed regulation:

Speed 1/min: 2700
Del.quantity cm³/
1000H.: 10,0...14,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 32,0

Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 0,5...1,3
mm: (0,2...1,6)
2nd speed 1/min: 1250
TD travel mm: 2,8...3,2
mm: (2,3...3,7)
3rd speed 1/min: 2250
TD travel mm: 7,3...8,1
mm: (7,0...8,4)

Supply-pump pressure characteristic:

1st speed 1/min: 800
Supply-pump
pressure bar: 3,6...4,2
2nd speed 1/min: 1250
Supply-pump
pressure bar: 4,9...5,5
3rd speed 1/min: 2250
Supply-pump
pressure bar: 7,7...8,3

Overflow quantity at overflow valve:

1st speed 1/min: 800
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 2250
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2950
Del.quantity cm³/: 0,0...6,0
1000H.: -
2nd speed 1/min: 2700
Del.quantity cm³/: 10,0...14,0
1000H.: (8,0...16,0)
3rd speed 1/min: 2575
Del.quantity cm³/: 15,0...25,0
1000H.: (14,0...26,0)
4th speed 1/min: 2250
Del.quantity cm³/: 23,0...25,0
1000H.: (21,8...26,2)
5th speed 1/min: 1500
Del.quantity cm³/: 24,3...25,3
1000H.: (22,6...27,0)
6th speed 1/min: 800
Del.quantity cm³/: 21,00...24,0
1000H.: (19,5...25,5)
7th speed 1/min: 600
Del.quantity cm³/: 17,0...21,0
1000H.: (14,5...24,5)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 450
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 425
Del.quantity cm³/: 9,5...11,5
1000H.: (6,5...14,5)
2nd speed 1/min: 450
Del.quantity cm³/: 5,5...8,5
1000H.: (3,0...11,0)

Residual:

Speed 1/min: 525
Del.quantity : 3,0...5,0
1000H.: (1,5...6,5)

Automatic starting fuel delivery:

1st speed 1/min: 200

Del.quantity cm³/: -
ind. 1000H: 30,0

2nd speed 1/min: 400
Del.quantity cm³/: -
max. 1000H : 30,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : 3,2...3,4
KF mm : 5,6...6,0
MS mm : 1,2...1,6

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 1,7 A2
Edition : 03.11.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/ 8F2300 R171-2
Type number : 0 460 484 034

Customer-specific information
Customer : PEUGEOT

Engine : XUD7

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : -
(from BDC): -

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 1250
Setting value bar: 4,3...4,9

Full-load del. w/out charge press.:

Speed 1/min : 1250
Del.quantity cm3/
1000H.: 28,0...29,0
Dispersion cm3/ : 2,0
1000H.: (2,5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 8,0...12,0
Dispersion cm3/ : 2,0
1000H.: -
Residual-Delivery Setting
Speed 1/min: 550
Del.quantity cm3/
1000H.: 3,5...4,5

Full-load speed regulation:

Speed 1/min: 2440
Del.quantity cm3/
1000H.: 19,0...25,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 42,0

Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
TD travel mm: 0,8...1,6
mm: (0,5...1,9)
2nd speed 1/min: 1250
TD travel mm: 3,4...3,8
mm: (3,1...4,1)
3rd speed 1/min: 2000
TD travel mm: 7,5...8,3
mm: (7,2...8,6)

Supply-pump pressure characteristic:

1st speed 1/min: 800
Supply-pump
pressure bar: 3,0...3,6
2nd speed 1/min: 1250
Supply-pump
pressure bar: 4,3...4,9
3rd speed 1/min: 2000

Supply-pump
pressure bar: 6,4...7,0

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 2250
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2650
Del.quantity cm³/: 3,5...10,5
1000H.: -
2nd speed 1/min: 2540
Del.quantity cm³/: 11,5...17,5
1000H.: (10,0...19,0)
3rd speed 1/min: 2440
Del.quantity cm³/: 19,0...25,0
1000H.: (18,0...26,0)
4th speed 1/min: 2250
Del.quantity cm³/: 27,5...29,5
1000H.: (26,2...30,8)
5th speed 1/min: 2000
Del.quantity cm³/: 27,5...29,5
1000H.: (26,2...30,8)
6th speed 1/min: 1250
Del.quantity cm³/: 28,0...29,0
1000H.: (26,2...30,8)
7th speed 1/min: 800
Del.quantity cm³/: 28,0...30,0
1000H.: (26,0...32,0)
8th speed 1/min: 500
Del.quantity cm³/: 28,0...31,0
1000H.: (26,5...32,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 2250
Del.quantity cm³/: 0...3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 8,0...12,0
1000H.: (6,0...14,0)

High Idle:

Speed 1/min: 450
Del.quantity cm³/: 8,0...12,0
1000H.: (6,0...14,0)

Residual:

Speed 1/min: 550
Del.quantity : 3,5...4,5
1000H.: (2,5...5,5)

Automatic starting fuel delivery:

1st speed 1/min: 200
Del.quantity cm³/: -
ind. 1000H.: 34,0

2nd speed 1/min: 300
Del.quantity cm³/: -
max. 1000H.: 64,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,3...5,7
MS	mm	: 1,2...1,6
XK	mm	: 18,7...20,7
XL	mm	: 13,2...16,6

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV 1,7A
Edition : 02.11.89
replaces : 10.12.86
Calibrating oil : ISO 4113

Injection pump : VE 4/ 9F2250 R187
Type number : 0 460 494 164

Customer-specific information
Customer : VWV

Engine : 086

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : -
(from BDC): -

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Setting value mm: 4,3...4,7

Supply-pump pressure:

Speed 1/min: 1500
Setting value bar: 4,8...5,4

Full-load del. w/out charge press.:

Speed 1/min: 1500
Del.quantity cm³/
1000H.: 34,5...35,5
Dispersion cm³/: 2,5
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 450
Del.quantity cm³/
1000H.: 6,0...10,0
Dispersion cm³/: 2,0
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2450
Del.quantity cm³/
1000H.: 12,0...18,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 35,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
TD travel mm: 2,1...2,9
mm: (1,8...3,2)
2nd speed 1/min: 1500
TD travel mm: 4,3...4,7
mm: (3,8...5,2)
3rd speed 1/min: 2250
TD travel mm: 7,4...8,2
mm: (7,1...8,5)

Supply-pump pressure characteristic:

1st speed 1/min: 600
Supply-pump
pressure bar: 2,5...3,1
2nd speed 1/min: 1500
Supply-pump
pressure bar: 4,8...5,4
3rd speed 1/min: 2250
Supply-pump
pressure bar: 6,7...7,3

Overflow quantity at overflow valve:

1st speed 1/min: 600
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 2250

Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2600
Del.quantity cm³/: 0,0...6,0
1000H.: -
2nd speed 1/min: 2450
Del.quantity cm³/: 12,0...18,0
1000H.: (11,0...19,0)
3rd speed 1/min: 2400
Del.quantity cm³/: 17,0...27,0
1000H.: (16,0...28,0)
4th speed 1/min: 2250
Del.quantity cm³/: 30,5...32,5
1000H.: (29,3...33,7)
5th speed 1/min: 1500
Del.quantity cm³/: 34,5...35,5
1000H.: (32,8...37,2)
6th speed 1/min: 600
Del.quantity cm³/: 24,0...27,0
1000H.: (22,5...28,5)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 450
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 450
Del.quantity cm³/: 6,0...10,0
1000H.: (4,0...12,0)
2nd speed 1/min: 1200
Del.quantity cm³/: 0,0...4,0
1000H.: —

Automatic starting fuel delivery:

1st speed 1/min: 360
Del.quantity cm³/: -
ind. 1000H: 35,0

2nd speed 1/min: 560
Del.quantity cm³/: -
max. 1000H : 35,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

K10

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,7...6,0
MS	mm	: 1,3...1,5
SVS max.	mm	: 4,8

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA 2,0F
Edition : 02.11.89
replaces : 03.08.88
Calibrating oil : ISO 4113

Injection pump : VE 4/ 9F2150 L202
Type number : 0 460 494 167

Customer-specific information
Customer : VM

Engine : HR 488 HJ

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : -
(from BDC) : -

Indicator setting:
Piston stroke mm : 1.0
Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000
Charge press. hPa: 800
Setting value mm: 1,5...1,9

Supply-pump pressure:

Speed 1/min: 1500
Charge press. hPa: 800
Setting value bar: 4,5...5,1

Full-load del. with charge press.:

Speed 1/min: 1500
Charge press. hPa: 800
Del.quantity cm3/
1000H.: 52,5...53,5
Dispersion cm3/ : 3,0
1000H : (3,0)

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm3/
1000H.: 39,5...40,5

Low-idle speed regulation:

Speed 1/min: 400
Del.quantity cm3/
1000H.: 11,0...15,0
Dispersion cm3/ : 2,5
1000H.: (2,5)

Full-load speed regulation:

Speed 1/min: 2420
Charge press. hPa: 800
Del.quantity cm3/
1000H: 12,0...18,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 36,0

Load-dependent start of delivery:

Speed 1/min: 1500
Charge press. hPa: -

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
Charge press. hPa: 800
TD travel mm: 1,3...2,1
mm: (1,0...2,4)
2nd speed 1/min: 1500
Charge press. hPa: 800
TD travel mm: 4,3...4,7
mm: (3,8...5,2)
3rd speed 1/min: 2150

Charge press. hPa: 800
TD travel mm: 7,6...8,4
mm: (7,3...8,7)

Supply-pump pressure characteristic:

1st speed 1/min: 750
Charge press. hPa: 800
Supply-pump pressure bar: 2,0...2,6
2nd speed 1/min: 1000
Charge press. hPa: 800
Supply-pump pressure bar: 2,8...3,4
3rd speed 1/min: 1500
Charge press. hPa: 800
Supply-pump pressure bar: 4,5...5,1
4th speed 1/min: 2150
Charge press. hPa: 800
Supply-pump pressure bar: 6,7...7,3

Overflow quantity at overflow valve:

1st speed 1/min: 750
Charge press. hPa: 800
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 2150
Charge press. hPa: 800
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 750
Charge-air pressure-setting point hPa: 400
LDA stroke mm: 5,7
Del.quantity cm³/: 41,5...43,5
1000H.: (40,0...45,0)
2nd speed 1/min: 2550
Charge press. hPa: 800
Del.quantity cm³/: 0,0...2,0
1000H.: -
3rd speed 1/min: 2420
Charge press. hPa: 800
Del.quantity cm³/: 12,0...18,0
1000H.: (11,0...19,0)
4th speed 1/min: 2150
Charge press. hPa: 800
Del.quantity cm³/: 42,3...45,3
1000H.: (41,6...46,0)
5th speed 1/min: 1500
Charge press. hPa: 800
Del.quantity cm³/: 52,5...53,5
1000H.: (51,0...55,0)
6th speed 1/min: 750
Charge press. hPa: 800

Del.quantity cm³/: 51,5...54,5
1000H.: -
7th speed 1/min: 750
Charge press. hPa: 400
Del.quantity cm³/: 41,5...43,5
1000H.: (40,0...45,0)
8th speed 1/min: 750
Del.quantity cm³/: 39,5...40,5
1000H.: (37,5...42,5)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 400
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 400
Del.quantity cm³/: 11,0...15,0
1000H.: (8,0...18,0)
2nd speed 1/min: 500
Del.quantity cm³/: 2,0...8,0
1000H.: (0,0...10,0)
3rd speed 1/min: 700
Del.quantity cm³/: 0,0...4,0
1000H.: (0,0...4,0)

Automatic starting fuel delivery:

1st speed 1/min: 400
Del.quantity cm³/: -
ind. 1000H.: 37,0

2nd speed 1/min: 500
Del.quantity cm³/: -
max. 1000H.: 45,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : 3,2...3,4
KF mm : 5,3...5,7
MS mm : 0,6...1,0
SVS max. mm : 1,7
XK mm : 17,0...19,0
XL mm : 8,8...12,2

Remarks:

* Correction at adjusting nut (46)



BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV 1,6 W17
Edition : 03.11.89
replaces : 08.12.86
Calibrating oil : ISO 4113

Injection pump : VE 4/ 9F2400 R221
Type number : 0 460 494 179

Customer-specific information
Customer : VW

Engine : 086

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : -
(from BDC): -

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000
Setting value mm: 1,0...1,8

Supply-pump pressure:

Speed 1/min: 600
Setting value bar: 2,1...2,7

Full-load del. w/out charge press.:

Speed 1/min: 1500
Del.quantity cm3/
1000H.: 31,5...32,5
Dispersion cm3/: 2,5
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 11,0...13,0
Dispersion cm3/: 2,0
1000H.: (3,0)

Residual-Delivery Setting

Speed 1/min: 550
Del.quantity cm3/
1000H.: 2,5...3,5

Full-load speed regulation:

Speed 1/min: 2600
Del.quantity cm3/
1000H.: 12,0...16,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 35,0

Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
TD travel mm: 1,0...1,8
mm: (0,7...2,1)
2nd speed 1/min: 1250
TD travel mm: 2,1...2,5
mm: (1,6...3,0)
3rd speed 1/min: 1800
TD travel mm: 4,2...5,0
mm: (3,9...5,3)
4th speed 1/min: 2400
TD travel mm: 6,1...6,9
mm: (5,8...7,2)

Supply-pump pressure characteristic:

1st speed 1/min: 600
Supply-pump
pressure bar: 2,1...2,7
2nd speed 1/min: 1250

Supply-pump
pressure bar: 4,0...4,6
3rd speed 1/min: 2400
Supply-pump
pressure bar: 7,3...7,9

Overflow quantity at overflow valve:

1st speed 1/min: 600
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 2400
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2800
Del.quantity cm³/: 0,0...4,0
1000H.: -
2nd speed 1/min: 2600
Del.quantity cm³/: 12,0...16,0
1000H.: (10,0...18,0)
3rd speed 1/min: 2500
Del.quantity cm³/: 19,0...29,0
1000H.: (18,0...30,0)
4th speed 1/min: 2400
Del.quantity cm³/: 27,0...29,0
1000H.: (25,8...30,2)
5th speed 1/min: 1500
Del.quantity cm³/: 31,5...32,5
1000H.: (29,8...34,2)
6th speed 1/min: 600
Del.quantity cm³/: 21,5...24,5
1000H.: (20,0...26,0)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 425
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 11,0...13,0
1000H.: (8,0...16,0)
2nd speed 1/min: 425
Del.quantity cm³/: 5,5...8,5
1000H.: (3,0...11,0)

High Idle:

Speed 1/min: 525
Del.quantity cm³/: 7,0...9,0
1000H.: (4,0...12,0)

Residual:

Speed 1/min: 500
Del.quantity : 2,5...4,5
1000H.: (1,0...6,0)

Automatic starting fuel delivery:

1st speed 1/min: 180
Del.quantity cm³/: -
ind. 1000H.: 35,0

2nd speed 1/min: 380
Del.quantity cm³/: -
max. 1000H.: 30,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : 3,2...3,4
KF mm : 5,7...6,0
MS mm : 1,3...1,5
XK mm : 17,0...19,0
XL mm : 9,8...13,2

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 1,7 P1
Edition : 06.11.89
replaces : 18.12.86
Calibrating oil : ISO 4113

Injection pump : VE 4/ 9F2400 R242
Type number : 0 460 494 193

Customer-specific information
Customer : FIAT

Engine : X8/57

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. : C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : -
(from BDC): -

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Charge press. hPa: 1000
Setting value mm: 4,9...5,3

Supply-pump pressure:

Speed 1/min: 1500
Charge press. hPa: 1000
Setting value bar: 5,5...6,1

Full-load del. with charge press.:

Speed 1/min: 1500
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 35,5...36,5
Dispersion cm3/ : 3,0
1000H : -

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm3/
1000H.: 25,3...26,3

Low-idle speed regulation:

Speed 1/min: 400
Del.quantity cm3/
1000H.: 4,0...8,0
Dispersion cm3/ : 3,0
1000H.: -

Full-load speed regulation:

Speed 1/min: 2650
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 17,0...23,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 48,0

Load-dependent start of delivery:

Speed 1/min: 1500
Charge press. hPa: -

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
Charge press. hPa: 1000
TD travel mm: 1,3...2,1
mm: (1,0...2,4)
2nd speed 1/min: 1500
Charge press. hPa: 1000
TD travel mm: 4,9...5,3
mm: (4,4...5,8)
3rd speed 1/min: 2000
Charge press. hPa: 1000
TD travel mm: 6,9...7,5
mm: (6,5...7,9)
4th speed 1/min: 2400

Charge press. hPa: 1000
TD travel mm: 8,5...9,3
mm: (8,2...9,6)

Supply-pump pressure characteristic:

1st speed 1/min: 750
Charge press. hPa: 1000
Supply-pump pressure bar: 3,6...4,2
2nd speed 1/min: 1500
Charge press. hPa: 1000
Supply-pump pressure bar: 5,5...6,1
3rd speed 1/min: 2000
Charge press. hPa: 1000
Supply-pump pressure bar: 6,5...7,1
4th speed 1/min: 2400
Charge press. hPa: 1000
Supply-pump pressure bar: 7,6...8,2

Overflow quantity at overflow valve:

1st speed 1/min: 750
Charge press. hPa: -
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 2400
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1100
Charge-air pressure-setting point hPa: 400
LDA stroke mm: 6,6
Del.quantity cm³/: 29,5...30,5
1000H.: (27,0...33,0)
2nd speed 1/min: 2950
Charge press. hPa: 1000
Del.quantity cm³/: 0,0...3,0
1000H.: -
3rd speed 1/min: 2850
Charge press. hPa: 1000
Del.quantity cm³/: 0,0...6,0
1000H.: -
4th speed 1/min: 2650
Charge press. hPa: 1000
Del.quantity cm³/: 17,0...23,0
1000H.: (16,0...24,0)
5th speed 1/min: 2400
Charge press. hPa: 1000
Del.quantity cm³/: 36,5...39,5
1000H.: (35,7...40,3)
6th speed 1/min: 1500
Charge press. hPa: 1000

Del.quantity cm³/: 35,5...36,5
1000H.: (33,7...38,3)
7th speed 1/min: 1100
Charge press. hPa: -
Del.quantity cm³/: 24,0...27,0
1000H.: -
8th speed 1/min: 1100
Charge press. hPa: 400
Del.quantity cm³/: 29,5...30,5
1000H.: (27,0...33,0)
9th speed 1/min: 750
Charge press. hPa: -
Del.quantity cm³/: 25,3...26,3
1000H.: (22,8...28,8)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 400
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 400
Del.quantity cm³/: 4,0...8,0
1000H.: (2,0...10,0)
2nd speed 1/min: 350
Del.quantity cm³/: 12,5...17,5
1000H.: -
3rd speed 1/min: 520
Del.quantity cm³/: 0,0...3,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 250
Del.quantity cm³/: -
ind. 1000H: 38,0
2nd speed 1/min: 350
Del.quantity cm³/: -
max. 1000H : 34,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : 3,2...3,4
KF mm : 5,7...6,0
MS mm : 1,4...1,65
SVS max. mm : -

XK mm : 17,0...19,0
XL mm : 9,1...12,5

Remarks:

Operate control lever after each
manifold-pressure compensator pressure
change.

* Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 1,9 K5
Edition : 06.11.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/ 9F2300 R272-1
Type number : 0 460 494 222

Customer-specific information
Customer : PEUGEOT

Engine : XUD9A

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : -
(from BDC): -

Indicator setting:
Piston stroke mm: 0.3
Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250
Setting value mm: 3,0...3,4

Supply-pump pressure:

Speed 1/min: 1250

Setting value bar: 3,9...4,5

Full-load del. w/out charge press.:

Speed 1/min : 1250
Del.quantity cm3/
1000H.: 30,3...31,3
Dispersion cm3/: 2,5
1000H.: -

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 8,0...10,0
Dispersion cm3/: 2,5
1000H.: -

Residual-Delivery Setting

Speed 1/min: 550
Del.quantity cm3/
1000H.: 0,0...6,0

Full-load speed regulation:

Speed 1/min: 2500
Del.quantity cm3/
1000H.: 19,0...25,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 45,0

Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
TD travel mm: 0,6...1,4
mm: (0,3...1,7)
2nd speed 1/min: 1250
TD travel mm: 3,0...3,4
mm: (2,7...3,7)
3rd speed 1/min: 2000
TD travel mm: 6,7...7,5
mm: (6,4...7,8)

Supply-pump pressure characteristic:

1st speed 1/min: 800
Supply-pump
pressure bar: 2,6...3,2
2nd speed 1/min: 1250

Supply-pump
pressure bar: 3,9...4,5
3rd speed 1/min: 2000
Supply-pump
pressure bar: 5,9...6,5

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 2250
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2650
Del.quantity cm³/: 0,0...10,0
1000H.: -
2nd speed 1/min: 2500
Del.quantity cm³/: 19,0...25,0
1000H.: (18,0...26,0)
3rd speed 1/min: 2250
Del.quantity cm³/: 32,3...35,3
1000H.: (31,5...36,1)
4th speed 1/min: 1250
Del.quantity cm³/: 30,3...31,3
1000H.: (28,5...33,1)
5th speed 1/min: 800
Del.quantity cm³/: 31,3...34,3
1000H.: (30,3...35,3)
6th speed 1/min: 500
Del.quantity cm³/: 31,3...34,3
1000H.: (30,3...35,3)

Zero delivery (stop):

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 8,0...10,0
1000H.: (5,0...13,0)

High Idle:

Speed 1/min: 470
Del.quantity cm³/: 8,0...10,0
1000H.: (5,0...13,0)

Residual:

Speed 1/min: 550
Del.quantity : 2,5...3,5
1000H.: (0,0...6,0)

Automatic starting fuel delivery:

1st speed 1/min: 200

Del.quantity cm³/: -
ind. 1000H: 40,0

2nd speed 1/min: 300
Del.quantity cm³/: -
max. 1000H : 35,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : 3,2...3,4
KF mm : 5,3...5,7
MS mm : 1,2...1,6

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : OPE 1,7 A
Edition : 09.11.89
replaces : 16.01.89
Calibrating oil : ISO 4113

Injection pump : VE 4/ 9F2300 R313
Type number : 0 460 494 229

Customer-specific information
Customer : OPEL

Engine : 17 YD

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : -
(from BDC): -

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000
Setting value mm: 2,0...2,4
KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1000
Setting value bar: 4,0...4,6

KSB solenoid-operated
valve volt: 12,0

Full-load del. w/out charge press.:

Speed 1/min: 1300
Del.quantity cm³/
1000H.: 31,1...32,1

KSB solenoid-operated
valve volt: 12,0
Dispersion cm³/: 2,5
1000H.: (2,5)

Low-idle speed regulation:

Speed 1/min: 400
Del.quantity cm³/
1000H.: 8,5...12,5

KSB solenoid-operated
valve volt: 12,0
Dispersion cm³/: 2,5
1000H.: (2,5)

Residual-Delivery Setting
Speed 1/min: 500
Del.quantity cm³/
1000H.: 1,5...2,5

KSB-Solenoid-Operated
valve Volt : 12,0
Dispersion cm³/: 3,0
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2575
Del.quantity cm³/
1000H.: 18,5...24,5

KSB solenoid-operated
valve volt: 12,0

Start:

Speed 1/min: 100
Del.quantity : 28,0...48,0
mind cm³/1000H.: -
KSB solenoid-operated
valve volt: 12,0

Load-dependent start of delivery:

Speed 1/min: 1000

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 300
TD travel mm: 0,8...3,2
mm: -

KSB solenoid-operated
 valve volt: -
 2nd speed 1/min: 800
 TD travel mm: 1,9...4,3
 mm: -
 KSB solenoid-operated
 valve volt: -
 3rd speed 1/min: 1000
 TD travel mm: 1,9...4,3
 mm: -
 KSB solenoid-operated
 valve volt: -
 4th speed 1/min: 800
 TD travel mm: 0,9...1,7
 mm: (0,6...2,0)
 KSB solenoid-operated
 valve volt: 12,0
 5th speed 1/min: 1000
 TD travel mm: 2,0...2,4
 mm: (1,5...2,9)
 KSB solenoid-operated
 valve volt: 12,0
 6th speed 1/min: 2000
 TD travel mm: 6,2...7,0
 mm: -
 KSB solenoid-operated
 valve volt: 12,0
 1st speed 1/min: 2300
 TD travel mm: 7,5...8,3
 mm: (7,2...8,6)
 KSB solenoid-operated
 valve volt: 12,0

Supply-pump pressure characteristic:

1st speed 1/min: 800
 Supply-pump
 pressure bar: 3,4...4,0
 KSB solenoid-operated
 valve volt: 12,0
 2nd speed 1/min: 1000
 Supply-pump
 pressure bar: 4,0...4,6
 KSB solenoid-operated
 valve volt: 12,0
 3rd speed 1/min: 2300
 Supply-pump
 pressure bar: 7,6...8,2
 KSB solenoid-operated
 valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 700
 KSB solenoid-operated
 valve volt: 12,0
 Overflow : 41...83
 quantity cm³/10s: (26...98)
 2nd speed 1/min: 2300

KSB solenoid-operated
 valve volt: 12,0
 Overflow : 55...138
 quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2735
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 7,0...11,0
 1000H.: (5,0...13,0)
 2nd speed 1/min: 2575
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 18,5...24,5
 1000H.: -
 3rd speed 1/min: 2300
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 27,9...30,5
 1000H.: (26,9...31,5)
 4th speed 1/min: 2000
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 27,1...29,7
 1000H.: (26,1...30,7)
 5th speed 1/min: 1300
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 31,1...32,1
 1000H.: (29,3...33,9)
 6th speed 1/min: 700
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 24,5...27,5
 1000H.: (23,0...29,0)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 400
 ELAB volt: -
 Del.quantity cm³/: 0,0...3,0
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 400
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 8,5...12,5
 1000H.: (6,5...14,5)

Residual:

Speed 1/min: 750

Del.quantity : 0,0...1,6
1000H.: -
KSB-Solenoid-operated
valve Volt: 12,0

Automatic starting fuel delivery:

1st speed 1/min: 400
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm3/: -
ind. 1000H: 25,0

2nd speed 1/min: 500
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm3/: -
max. 1000H : 32,5

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,3...5,7
MS	mm	: 0,5...0,9
XK	mm	: 16,1...18,1
XL	mm	: 11,0...14,4

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : OPE 1,7 B
Edition : 09.11.89
replaces : 16.01.89
Calibrating oil : ISO 4113

Injection pump : VE 4/ 9F2300 R313-1
Type number : 0 460 494 230

Customer-specific information
Customer : OPEL

Engine : 17 YD

TEST BENCH REQUIREMENTS

Calibrating-oil:
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : -
(from BDC): -

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Setting value mm: 4,2...4,6
KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1500
Setting value bar: 5,4...6,0

KSB solenoid-operated
valve volt: 12,0

Full-load del. w/out charge press.:

Speed 1/min: 1300
Del.quantity cm3/
1000H.: 31,1...32,1

KSB solenoid-operated
valve volt: 12,0
Dispersion cm3/: 2,5
1000H.: (2,5)

Low-idle speed regulation:

Speed 1/min: 400
Del.quantity cm3/
1000H.: 7,0...11,0

KSB solenoid-operated
valve volt: 12,0
Dispersion cm3/: 2,5
1000H.: (2,5)

Full-load speed regulation:

Speed 1/min: 2575
Del.quantity cm3/
1000H.: 18,5...24,5

KSB solenoid-operated
valve volt: 12,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 26,0
KSB solenoid-operated
valve volt: 12,0

Load-dependent start of delivery:

Speed 1/min: 1500

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 300
TD travel mm: 0,8...3,2
mm: -

KSB solenoid-operated
valve volt: -
2nd speed 1/min: 800
TD travel mm: 1,9...4,3
mm: -

KSB solenoid-operated
valve volt: -
3rd speed 1/min: 1000

TD travel mm: 1,9...4,3
mm: -
KSB solenoid-operated
valve volt: -
4th speed 1/min: 800
TD travel mm: 0,9...1,7
mm: (0,6...2,0)

KSB solenoid-operated
valve volt: 12,0
5th speed 1/min: 1500
TD travel mm: 4,2...4,6
mm: (3,9...4,9)

KSB solenoid-operated
valve volt: 12,0
6th speed 1/min: 2000
TD travel mm: 6,2...7,0
mm: -

KSB solenoid-operated
valve volt: 12,0

1st speed 1/min: 2300
TD travel mm: 7,5...8,3
mm: (7,2...8,6)

KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure characteristic:

1st speed 1/min: 800
Supply-pump
pressure bar: 3,4...4,0

KSB solenoid-operated
valve volt: 12,0
2nd speed 1/min: 1500

Supply-pump
pressure bar: 5,4...6,0

KSB solenoid-operated
valve volt: 12,0
3rd speed 1/min: 2300

Supply-pump
pressure bar: 7,6...8,2

KSB solenoid-operated
valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 700
KSB solenoid-operated
valve volt: 12,0
Overflow : 41...83
quantity cm³/10s: (26...98)

2nd speed 1/min: 2300
KSB solenoid-operated
valve volt: 12,0
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2735

KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 7,0...11,0
1000H.: (5,0...13,0)

2nd speed 1/min: 2575
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 18,5...24,5
1000H.: -

3rd speed 1/min: 2300
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 27,9...30,5
1000H.: (27,2...31,2)

4th speed 1/min: 2000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 27,1...29,7
1000H.: -

5th speed 1/min: 1300
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 31,1...32,1
1000H.: (29,6...33,6)

6th speed 1/min: 700
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 24,5...27,5
1000H.: (23,7...28,3)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 400
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 425
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 7,0...11,0
1000H.: (5,0...13,0)

2nd speed 1/min: 500
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 2,5...8,5
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 400
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: -
ind. 1000H: 22,0

2nd speed 1/min: 500
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: -
max. 1000H : 25,5

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,3...5,7
MS	mm	: 0,5...0,9

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 1,9 K4
Edition : 06.11.89
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/ 9F2300 R272-2
Type number : 0 460 494 240

Customer-specific information
Customer : PEUGEOT

Engine : XUD9A

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : -
(from BDC): -

Indicator setting:
Piston stroke mm: 0.3
Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250
Setting value mm: 2,6...3,0

Supply-pump pressure:

Speed 1/min: 1250

Setting value bar: 3,9...4,5

Full-load del. w/out charge press.:

Speed 1/min : 1250
Del.quantity cm3/
1000H.: 30,0...31,0
Dispersion cm3/: 2,5
1000H.: -

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 8,0...10,0
Dispersion cm3/: 2,5
1000H.: -

Residual-Delivery Setting

Speed 1/min: 550
Del.quantity cm3/
1000H.: 0,0...6,0

Full-load speed regulation:

Speed 1/min: 2500
Del.quantity cm3/
1000H: 19,0...25,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 45,0

Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
TD travel mm: 0,2...1,0
mm: (0,0...1,3)

2nd speed 1/min: 1250
TD travel mm: 2,6...3,0
mm: (2,3...3,3)

3rd speed 1/min: 2000
TD travel mm: 6,0...6,8
mm: (5,7...7,1)

Supply-pump pressure characteristic:

1st speed 1/min: 800
Supply-pump
pressure bar: 2,6...3,2
2nd speed 1/min: 1250

Supply-pump
pressure bar: 3,9...4,5
3rd speed 1/min: 2000
Supply-pump
pressure bar: 5,9...6,5

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 2250
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2650
Del.quantity cm³/: 0,0...10,0
1000H.: -
2nd speed 1/min: 2500
Del.quantity cm³/: 19,0...25,0
1000H.: (18,0...26,0)
3rd speed 1/min: 2250
Del.quantity cm³/: 31,5...34,5
1000H.: (30,7...35,3)
4th speed 1/min: 1250
Del.quantity cm³/: 30,0...31,0
1000H.: (28,2...32,8)
5th speed 1/min: 800
Del.quantity cm³/: 30,7...33,7
1000H.: (29,7...34,7)
6th speed 1/min: 500
Del.quantity cm³/: 30,7...33,7
1000H.: (29,7...34,7)

Zero delivery (stop):

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 8,0...10,0
1000H.: (6,0...12,0)

High Idle:

Speed 1/min: 470
Del.quantity cm³/: 8,0...10,0
1000H.: (6,0...12,0)

Residual:

Speed 1/min: 550
Del.quantity : 2,5...3,5
1000H.: (0,0...6,0)

Automatic starting fuel delivery:

1st speed 1/min: 200

Del.quantity cm³/: -
ind. 1000H: 40,0

2nd speed 1/min: 300
Del.quantity cm³/: -
max. 1000H : 35,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,3...5,7
MS	mm	: 1,2...1,6

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 1,7 P11
Edition : 06.11.89
replaces : 19.07.89
Calibrating oil : ISO 4113

Injection pump : VE 4/ 9F2300 256-2
Type number : 0 460 494 253
Customer Part-No. :

Customer-specific information
Customer : FIAT-AUTO

Engine : M705 LA 19.0

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : -
(from BDC): -

Indicator setting:
Piston stroke mm: 1.0
Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Setting value mm: 4,4...4,8

Supply-pump pressure:

Speed 1/min: 1500
Setting value bar: 5,3...5,9

Full-load del. w/out charge press.:

Speed 1/min : 1500
Del.quantity cm3/
1000H.: 28,0...29,0
Dispersion cm3/: 2,5
1000H.: -

Low-idle speed regulation:

Speed 1/min: 390
Del.quantity cm3/
1000H.: 10,0...14,0
Dispersion cm3/: 2,5
1000H.: (2,5)

Full-load speed regulation:

Speed 1/min: 2500
Del.quantity cm3/
1000H.: 18,5...24,5

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 55,0

Load-dependent start of delivery:

Speed 1/min: 1500

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
TD travel mm: 1,1...1,9
mm: (0,8...2,2)
2nd speed 1/min: 1500
TD travel mm: 4,4...4,8
mm: (3,9...5,3)
3rd speed 1/min: 2000
TD travel mm: 6,6...7,4
mm: (6,2...7,8)
4th speed 1/min: 2300
TD travel mm: 7,8...8,6
mm: (7,5...8,9)

Supply-pump pressure characteristic:

1st speed 1/min: 600
Supply-pump
pressure bar: 3,1...3,7

2nd speed 1/min: 1500
Supply-pump pressure bar: 5,3...5,9
3rd speed 1/min: 2300
Supply-pump pressure bar: 7,1...7,7

Overflow quantity at overflow valve:

1st speed 1/min: 600
Overflow quantity : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 2300
Overflow quantity : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2900
Del.quantity cm3/: 0,0...6,0
1000H.: -
2nd speed 1/min: 2650
Del.quantity cm3/: 4,5...11,5
1000H.: (3,0...11,0)
3rd speed 1/min: 2500
Del.quantity cm3/: 18,5...24,5
1000H.: (17,5...25,5)
4th speed 1/min: 2300
Del.quantity cm3/: 29,3...31,7
1000H.: (28,2...32,8)
5th speed 1/min: 1500
Del.quantity cm3/: 28,0...29,0
1000H.: (26,2...30,8)
6th speed 1/min: 1000
Del.quantity cm3/: 27,8...30,2
1000H.: (26,7...31,3)
7th speed 1/min: 600
Del.quantity cm3/: 28,9...31,9
1000H.: (27,4...33,4)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 390
ELAB volt: -
Del.quantity cm3/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 390
Del.quantity cm3/: 10,0...14,0
1000H.: (7,0...17,0)
2nd speed 1/min: 440
Del.quantity cm3/: 0,0...6,0
1000H.: (0,0...8,5)
3rd speed 1/min: 500

Del.quantity cm3/: 0,0...3,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 300
Del.quantity cm3/: -
ind. 1000H.: 48,0

2nd speed 1/min: 400
Del.quantity cm3/: -
max. 1000H.: 45,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : 5,6...6,0
KF mm : 3,2...3,4
MS mm : 1,6...2,0
XK mm : 17,0...19,0
XL mm : 9,8...13,2

Remarks:

:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV 2,0 K1
Edition : 06.11.89
replaces : 03.03.89
Calibrating oil : ISO 4113

Injection pump : VE 5/ 9F2250 L245
Type number : 0 460 495 001
Customer Part-No. :

Customer-specific information
Customer : VW

Engine : 153T-LLK

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C :
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : -
(from BDC): -

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Charge press. hPa: 750
Setting value mm: 3,0...3,4
KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1500
Charge press. hPa: 750
Setting value bar: 6,0...6,6
KSB solenoid-operated
valve volt: 12,0

Full-load del. with charge press.:

Speed 1/min: 1500
Del.quantity cm3/
1000H.: 42,7...43,7
KSB solenoid-operated
valve volt: 12,0
Dispersion cm3/ : 2,5
1000H : (3,0)

Full-load del. w/out charge press.:

Speed 1/min : 700
Del.quantity cm3/
1000H.: 27,0...28,0
KSB solenoid-operated
valve volt: 12,0

Low-idle speed regulation:

Speed 1/min: 390
Del.quantity cm3/
1000H.: 10,0...12,0
KSB solenoid-operated
valve volt: 12,0
Dispersion cm3/ : 2,5
1000H.: (3,0)

Residual-Delivery Setting

Speed 1/min: 540
Del.quantity cm3/
1000H.: 2,5...3,5
KSB-Solenoid-Operated
valve Volt : 12,0

Full-load speed regulation:

Speed 1/min: 2525
Del.quantity cm3/
1000H: 16,0...20,0
KSB solenoid-operated
valve volt: 12,0

Start:

Speed 1/min: 100
Del.quantity : 37,0...48,0
mind cm3/1000H.: -
KSB solenoid-operated
valve volt: 12,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
 Charge press. hPa: 750
 TD travel mm: 2,3...2,7
 mm: 1,5...3,5
 KSB solenoid-operated
 valve volt: -
 2nd speed 1/min: 1000
 Charge press. hPa: 750
 TD travel mm: 0,8...1,6
 mm: (0,5...1,9)
 KSB solenoid-operated
 valve volt: 12,0
 3rd speed 1/min: 1500
 Charge press. hPa: 750
 TD travel mm: 3,0...3,4
 mm: (1,5...3,9)
 KSB solenoid-operated
 valve volt: 12,0
 4th speed 1/min: 2250
 Charge press. hPa: 750
 TD travel mm: 6,0...6,8
 mm: (5,7...7,1)
 KSB solenoid-operated
 valve volt: 12,0

Supply-pump pressure characteristic:

1st speed 1/min: 500
 Charge press. hPa: 750
 Supply-pump
 pressure bar: 5,2...6,4
 KSB solenoid-operated
 valve volt: -
 2nd speed 1/min: 700
 Charge press. hPa: 750
 Supply-pump
 pressure bar: 4,1...4,7
 KSB solenoid-operated
 valve volt: 12,0
 3rd speed 1/min: 1500
 Charge press. hPa: 750
 Supply-pump
 pressure bar: 6,0...6,6
 KSB solenoid-operated
 valve volt: 12,0
 4th speed 1/min: 2250
 Charge press. hPa: 750
 Supply-pump
 pressure bar: 7,7...8,3
 KSB solenoid-operated
 valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 700
 Charge press. hPa: -
 KSB solenoid-operated
 valve volt: 12,0

Overflow : 41...83
 quantity cm³/10s: (26...98)
 2nd speed 1/min: 2250
 Charge press. hPa: 750
 KSB solenoid-operated
 valve volt: 12,0
 Overflow : 55...138
 quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 850
 Charge-air pressure-setting
 point hPa: 350
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 33,5...34,5
 1000H.: (31,0...37,0)
 2nd speed 1/min: 2525
 Charge press. hPa: 750
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 16,0...20,0
 1000H.: (14,0...22,0)
 3rd speed 1/min: 2425
 Charge press. hPa: 750
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 25,5...35,5
 1000H.: (24,5...36,5)
 4th speed 1/min: 2250
 Charge press. hPa: 750
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 37,5...39,5
 1000H.: (36,3...40,7)
 5th speed 1/min: 1500
 Charge press. hPa: 750
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 42,7...43,7
 1000H.: (41,0...45,4)
 6th speed 1/min: 850
 Charge press. hPa: 350
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 33,5...34,5
 1000H.: (31,0...37,0)
 7th speed 1/min: 700
 Charge press. hPa: -
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 27,0...28,0
 1000H.: (24,5...30,5)
 8th speed 1/min: 700
 Charge press. hPa: 750
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 37,0...40,0
 1000H.: (35,5...41,5)

9th speed 1/min: 500
Charge press. hPa: -
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 24,5...29,5
1000H: (22,0...32,0)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 415
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 390
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 10,0...12,0
1000H.: (5,5...16,5)
2nd speed 1/min: 415
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 6,0...10,0
1000H.: (2,5...13,5)

Residual:

Speed 1/min: 490
Del.quantity : 3,3...5,3
1000H.: (0,8...7,8)
KSB-Solenoid-operated
valve Volt: 12,0

Automatic starting fuel delivery:

3rd speed 1/min: 190
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 35,0...85,0
1000H: -

4th speed 1/mi: 390
KSB solenoid-operated
valve Volt: 12,0
Del.quantity cm³/: 15,0...35,0
1000: -

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

L05

Designation

K	mm	: K1
KF	mm	: -
MS	mm	: 1,6...2,0
SVS max.	mm	: 1,3
XK	mm	: 17,0...19,0
XL	mm	: 10,3...13,7

Remarks:

:

Operate control lever after each
manifold-pressure compensator pressure
change.

* Correction at adjusting nut (46)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet :
Edition : 06.10.89
Replaces :
Test oil : ISO-4113

Combination no. : 0 400 064 034

Injection pump
Pump designation : PES4M55C120RS106
EP type number : 0 410 054 986
Governor
Governor design. : RSV350...1750MOB129
Governor no. : 0 420 035 078

Customer-spec. information
Customer : ME-NFZ

Engine : OM616/932

1st version kW : 44.0

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 1 417 413 012

Inlet press., bar : 1.00

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 003

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...34

Prestroke mm : 1.70...1.80
: (1.65...1.85)
Rack travel in mm : 18.50...21.50
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - , : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1730

Rack travel in mm : 13.10...13.20

Del.quantity cm³/ : 3.8...3.9

100 s : (3.7...4.0)

Spread cm³ : 0.2

100 s : (0.3)

2nd speed rpm : 350.0

Rack travel in mm : 6.8...7.0

Del.quantity cm³/ : 0.6...0.8

100 s : (0.5...0.8)

Spread cm³ : 0.1

100 s : (0.1)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1730

Del.quantity : 38.5...39.5

1000 : (37.5...40.5)

Spread cm³ : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 52...60

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 12.20

Speed rpm : 1760...1780

2nd rack travel in: 4.00

Speed rpm : 1885...1915

4th rack travel in: 1970

Speed rpm : 0.30...1.70

LOW IDLE 1
Control lever
position degrees: 14...22
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.4

Testing:

Speed rpm : 100
Minimum rack trave: 20.30
Speed rpm : 350
Rack travel in mm : 6.30...6.50
Rack travel in mm : 2.00
Speed rpm : 770...830
Speed rpm : 900
Maximum rack trave: 1.50

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1730
Rack travel in m: 13.10...13.20
2nd speed rpm : 1100
Rack travel in m: 13.70...13.90
3rd speed rpm : 600
Rack travel in m: 14.10...14.30

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1100
Del.quantity cm3/ : 37.5...39.5
1000 s: (36.5...40.5)
Spread cm3 : 2.50
1000 s: (3.)
Speed rpm : 600
Del.quantity cm3/ : 38.0...40.0
1000 s: (37.0...41.0)
Spread cm3 : 2.50
1000 s: (3.00)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.20
Speed rpm : 1760...1780

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 53.0...0.0
1000 s: (50.0...0.0)
Rack travel in mm : 20.30...0.00

LOW IDLE

L07

Speed rpm : 350
Rack travel in mm : 6.80...7.00
Del.quantity cm3/ : 6.0...8.0
1000 s: (5.5...8.5)
Spread cm3 : 1.00
1000 s: (1.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL 7,1 d
Edition : 09.11.89
Replaces : -
Test oil : ISO-4113
Combination no. : 0 401 846 505
Injection pump
Pump designation : PE6P110A320RS483
EP type number : 0 411 816 159
Governor
Governor design. : RGV250...1200PA918
Governor no. : 0 421 813 772

Customer-spec. information
Customer : VOLVO

Engine : TD71F

1st version kW : 162.0
Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10
: (2.95...3.15)
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.30...12.40

Del. quantity cm³/ : 12.7...12.9

100 s: (12.4...13.2)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.3...5.5

Del. quantity cm³/ : 1.6...2.0

100 s: (1.3...2.3)

Spread cm³ : 0.3

100 s: (0.6)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.10...1.30

2nd speed rpm : 380

travel mm : 2.30...2.60

3rd speed rpm : 500

travel mm : 2.90...3.30

4th speed rpm : 1260

travel mm : 7.70...7.90

5th speed rpm : 1400

travel mm : 9.00...9.30

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1330

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del. quantity : 127.0...129.0

1000 : (124.0...132.0)

Spread cm³ : 4.00
 1000 : (7.50)

RATED SPEED

1st version
Control lever
position degrees: 54...62

Testing:
1st rack travel in: 11.30
Speed rpm : 1240...1250
2nd rack travel in: 4.00
Speed rpm : 1380...1410
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 6...14

Testing:
Speed rpm : 100
Minimum rack travel: 6.80
Speed rpm : 250
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION
Speed rpm : 250...450

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 12.30...12.40

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.20...10.30
2nd pressure hPa : 570
Rack travel in m: 12.10...12.20

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: -
Speed rpm : 700
Del.quantity cm³/ : 85.0...88.0
 1000 s: (82.0...91.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.30
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 170.0...200.0
 1000 s: (166.0...204.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.30...5.50
Del.quantity cm³/ : 16.0...20.0
 1000 s: (13.0...23.0)
Spread cm³ : 3.00
 1000 s: (6.00)

Remarks:

:
Delivery-valve spring pre-tension =
2.40...2.60 mm.
Permissible alteration from 2.20...2.90
mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL 7,1 d 1
 Edition : 09.11.89
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 401 846 506
 Injection pump
 Pump designation : PE6P110A320RS483-1
 EP type number : 0 411 816 160
 Governor
 Governor design. : RQV250...1200PA918-1
 Governor no. : 0 421 813 773

Customer-spec. information
 Customer : VOLVO

Engine : TD71FS

1st version kW : 180.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10
 : (2.95...3.15)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.10...13.20

Del.quantity cm³/ : 14.2...14.4

100 s: (13.9...14.7)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.3...5.5

Del.quantity cm³/ : 1.6...2.0

100 s: (1.3...2.3)

Spread cm³ : 0.3

100 s: (0.6)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.10...1.30

2nd speed rpm : 380

travel mm : 2.30...2.60

3rd speed rpm : 500

travel mm : 2.90...3.30

4th speed rpm : 1260

travel mm : 7.70...7.90

5th speed rpm : 1400

travel mm : 9.00...9.30

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1330

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1200

Del.quantity : 142.0...144.0

1000 : (139.0...147.0)

Spread cm³ : 4.00
1000 : (7.50)

RATED SPEED

1st version
Control lever
position degrees: 54...62

Testing:
1st rack travel in: 12.10
Speed rpm : 1240...1250
2nd rack travel in: 4.00
Speed rpm : 1385...1415
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 6...14

Testing:
Speed rpm : 100
Minimum rack travel: 6.80
Speed rpm : 250
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION
Speed rpm : 250...450

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 1200
Rack travel mm : 13.10...13.20

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.20...10.30
2nd pressure hPa : 710
Rack travel in m: 12.20...12.30

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 1000
Del.quantity cm³/ : 134.0...138.0
1000 s: (131.0...141.0)
Aneroid pressure h: -
Speed rpm : 700
Del.quantity cm³/ : 85.0...88.0
1000 s: (82.0...91.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 12.10
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 170.0...200.0
1000 s: (166.0...204.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.30...5.50
Del.quantity cm³/ : 16.0...20.0
1000 s: (13.0...23.0)
Spread cm³ : 3.00
1000 s: (6.00)

Remarks:

Delivery-valve spring pre-tension =
2.40...2.60 mm.
Permissible alteration from 2.20...2.90
mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL 10,0 z
 Edition : 09.11.89
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 401 846 529
 Injection pump
 Pump designation : PE6P120A320RS3186
 EP type number : 0 411 826 756
 Governor
 Governor design. : RQV250..1025PA921-4
 Governor no. : 0 421 813 787

Customer-spec. information
 Customer : VOLVO

Engine : TD102F

1st version kW : 220.0
 Rated speed : 2050

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.60...2.70
 : (2.55...2.75)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 11.40...11.50

Del.quantity cm³/ : 19.7...19.9

100 s: (19.4...20.2)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 4.2...4.4

Del.quantity cm³/ : 1.7...2.2

100 s: (1.4...2.4)

Spread cm³ : 0.5

100 s: (0.7)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.20...1.30

2nd speed rpm : 430

travel mm : 3.50...3.80

3rd speed rpm : 700

travel mm : 6.40...6.60

4th speed rpm : 900

travel mm : 6.40...6.60

5th speed rpm : 1080

travel mm : 8.30...8.50

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1080

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1000

Del.quantity : 197.0...199.0
1000 : (194.0...202.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 58...66

Testing:

1st rack travel in: 10.40
Speed rpm : 1055...1065
2nd rack travel in: 4.00
Speed rpm : 1110...1140
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 4...12

Testing:

Speed rpm : 100
Minimum rack travel: 5.70
Speed rpm : 250
Rack travel in mm : 4.20...4.40

CONSTANT REGULATION

Speed rpm : 250...350

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : 1000
Rack travel mm : 11.40...11.50

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 8.80...9.00
2nd pressure hPa : 80
Rack travel in m: 9.00...9.10
3rd pressure hPa : 400
Rack travel in m: 10.90...11.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -
Speed rpm : 700
Del.quantity cm³/ : 143.0...145.0
1000 s: (140.0...148.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.40
Speed rpm : 1055...1065

LOW IDLE

Speed rpm : 250
Rack travel in mm : 4.20...4.40
Del.quantity cm³/ : 17.0...22.0
1000 s: (14.5...24.5)
Spread cm³ : 5.00
1000 s: (7.00)

Remarks:

:

Delivery-valve spring pre-tension =
2.40...2.60 mm.
Permissible alteration from 2.20...2.90
mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL 7,1 d 2
 Edition : 01.12.89
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 401 846 534
 Injection pump
 Pump designation : PE6P110A320RS483-4
 EP type number : 0 411 816 172
 Governor
 Governor design. : RQV250...1200PA918-2
 Governor no. : 0 421 813 774

Customer-spec. information
 Customer : VOLVO

Engine : TD71FD

1st version kW : 158.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10
 : (2.95...3.15)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.00...12.10

Del.quantity cm³/ : 12.0...12.2

100 s: (11.7...12.5)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.3...5.5

Del.quantity cm³/ : 1.6...2.0

100 s: (1.3...2.3)

Spread cm³ : 0.3

100 s: (0.6)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
 travel mm : 1.10...1.30

2nd speed rpm : 380
 travel mm : 2.30...2.60

3rd speed rpm : 500
 travel mm : 2.90...3.30

4th speed rpm : 1260
 travel mm : 7.70...7.90

5th speed rpm : 1400
 travel mm : 9.00...9.30

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1330

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 120.0...122.0

1000 : (117.0...125.0)

Spread cm³ : 4.00
1000 : (7.50)

RATED SPEED

1st version
Control lever
position degrees: 54...62

Testing:

1st rack travel in: 11.00
Speed rpm : 1260...1270
2nd rack travel in: 4.00
Speed rpm : 1390...1420
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 6...14

Testing:

Speed rpm : 100
Minimum rack travel: 6.80
Speed rpm : 250
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION

Speed rpm : 250...450

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 12.00...12.10

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.20...10.30
2nd pressure hPa : 560
Rack travel in m: 11.80...11.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 700
Del.quantity cm³/ : 85.0...88.0
1000 s: (82.0...91.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.00
Speed rpm : 1260...1270

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 170.0...200.0
1000 s: (166.0...204.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.30...5.50
Del.quantity cm³/ : 16.0...20.0
1000 s: (13.0...23.0)
Spread cm³ : 3.00
1000 s: (6.00)

Remarks:

Delivery-valve spring pre-tension =
2.40...2.60 mm.
Permissible alteration from 2.20...2.90
mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : ENA 12,0 a
Edition : 01.12.89
Replaces : 29.3.89
Test oil : ISO-4113

Combination no. : 0 401 846 548

Injection pump
Pump designation : PE6P120A320RS257
EP type number : 0 411 826 075
Governor
Governor design. : RQ250/1100PA877
Governor no. : 0 421 801 409

Customer-spec. information
Customer : ENASA

Engine : 96T1AZ

1st version kW : 228.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
: (2.75...2.95)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 10.90...11.00

Del.quantity cm3/ : 18.4...18.6

100 s: (18.1...18.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 5.5...5.7

Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.40...16.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del.quantity : 184.0...186.0

1000 : (181.0...189.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 16.0

Testing:

1st rack travel in: 9.60

Speed rpm : 1145...1160
2nd rack travel in: 4.00
Speed rpm : 1190...1220
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 250

Rack travel in mm : 5.6

Testing:

Speed rpm : 100

Minimum rack travel: 7.10

Speed rpm : 250

Rack travel in mm : 5.50...5.70

Rack travel in mm : 2.00

Speed rpm : 340...380

TORQUE CONTROL

Dimension a mm : 0.20

Torque control curve - 1st version

1st speed rpm : 600

Rack travel in m: 10.90...11.00

2nd speed rpm : 1080

Rack travel in m: 10.60...10.80

3rd speed rpm : 720

Rack travel in m: 10.70...10.90

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 900

Rack travel mm : 10.90...11.00

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 8.70...9.10

2nd pressure hPa : 340

Rack travel in m: 9.30...9.40

3rd pressure hPa : 470

Rack travel in m: 10.10...10.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 1080

Del.quantity cm³/ : 198.0...204.0
1000 s: (195.0...207.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm³/ : 130.0...132.0
1000 s: (127.0...135.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.60

Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm³/ : 130.0...150.0
1000 s: (126.0...154.0)

Rack travel in mm : 19.50...21.00

Remarks:

:
Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : ENA 11,9 a1
 Edition : 01.12.89
 Replaces : 24.2.89
 Test oil : ISO-4113
 Combination no. : 0 401 846 550
 Injection pump
 Pump designation : PE6P120A320RS257
 EP type number : 0 411 826 075
 Governor
 Governor design. : RQV250...1050PA808
 Governor no. : 0 421 813 553

Customer-spec. information
 Customer : ENASA

Engine : 96 T1 CX

1st version kW : 228.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 10.90...11.00

Del. quantity cm³/ : 20.9...21.1

100 s: (20.6...21.4)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 5.6...5.8

Del. quantity cm³/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.00...1.40

2nd speed rpm : 350

travel mm : 1.90...2.50

3rd speed rpm : 700

travel mm : 4.50...5.10

4th speed rpm : 1095

travel mm : 8.00...8.20

5th speed rpm : 1185

travel mm : 9.00...9.40

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1110

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1030

Aneroid pressure h: 900

Del.quantity : 209.0...211.0
1000 : (206.0...214.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 48...56

Testing:

1st rack travel in: 9.90
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1160...1190
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 13...21

Testing:

Speed rpm : 100
Minimum rack travel: 7.20
Speed rpm : 250
Rack travel in mm : 5.60...5.80

CONSTANT REGULATION

Speed rpm : 250...430

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 10.90...11.00

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 8.30...8.70
2nd pressure hPa : 510
Rack travel in m: 10.40...10.50
3rd pressure hPa : 300
Rack travel in m: 9.20...9.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 650
Del.quantity cm3/ : 187.0...193.0
1000 s: (184.0...196.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 119.0...121.0
1000 s: (116.0...124.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.90
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 130.0...150.0
1000 s: (126.0...154.0)
Rack travel in mm : 19.50...21.00

Remarks:

:

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 9,8 h
Edition : 01.12.89
Replaces : 30.9.88
Test oil : ISO-4113

Combination no. : 0 401 846 561

Injection pump
Pump designation : PE6P120A32ORS519
EP type number : 0 411 826 145
Governor
Governor design. : RQ275/1050PA899
Governor no. : 0 421 801 460

Customer-spec. information
Customer : RVI

Engine : MIHS 06.20.45

1st version kW : 185.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
: (2.75...2.95)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.00...11.10

Del.quantity cm3/ : 16.7...16.9

100 s: (16.4...17.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.40...5.80

Del.quantity cm3/ : 1.3...1.9

100 s: (1.0...2.2)

Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 700

Del.quantity : 167.0...169.0

1000 : (164.0...172.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 10.00

Speed rpm : 1110...1125
2nd rack travel in: 4.00
Speed rpm : 1195...1225
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 275
Rack travel in mm : 5.6

Testing:

Speed rpm : 200
Minimum rack travel: 7.30
Speed rpm : 275
Rack travel in mm : 5.40...5.80
Rack travel in mm : 2.00
Speed rpm : 275...315

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : 700
Rack travel mm : 11.00...11.10

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.60...9.80
2nd pressure hPa : 260
Rack travel in m: 10.60...10.70
3rd pressure hPa : 220
Rack travel in m: 9.90...10.10

START CUT-OUT

Speed 1/min : 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 750
Del.quantity cm3/ : 159.0...165.0
1000 s: (156.0...168.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 104.0...106.0
1000 s: (101.0...109.0)

BREAKAWAY

1st version

L21

1mm rack travel less than

full load rack tr: 10.00
Speed rpm : 1110...1125

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 140.0...160.0
1000 s: (136.0...164.0)

LOW IDLE

Speed rpm : 275
Rack travel in mm : -5.20...-5.60
Del.quantity cm3/ : 13.0...19.0
1000 s: (10.0...22.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

:

APPLICATION

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,0 c 5
 Edition : 01.12.89
 Replaces : 28.6.89
 Test oil : ISO-4113
 Combination no. : 0 401 846 749
 Injection pump
 Pump designation : PE6P110A320LS3805-10
 EP type number : 0 411 816 740
 Governor
 Governor design. : RQ300/1150PA187-6
 Governor no. : 0 421 801 155

Customer-spec. information
 Customer : DAIMLER-BENZ

Engine : OM421

1st version kW : 159.0
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10
 : (3.95...4.15)
 Rack travel in mm : 9.00...12.00
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-45-120-165-240-285

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 11.70...11.80

Del.quantity cm3/ : 11.4...11.6

100 s: (11.1...11.9)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 7.8...8.0

Del.quantity cm3/ : 1.2...1.8

100 s: (0.9...2.0)

Spread cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 650

Rack travel in mm : 12.80...13.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Del.quantity : 114.0...116.0

1000 : (111.0...119.0)

Spread cm3 : 4.00

1000 : (7.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 650

Rack travel in mm : 13.2

Testing:

1st rack travel in: 10.70

Speed rpm : 1190...1200

2nd rack travel in: 4.00
Speed rpm : 1235...1265
4th rack travel in: 1350
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 7.9

Testing:

Speed rpm : 100
Minimum rack travel: 9.50
Speed rpm : 300
Rack travel in mm : 7.80...8.00
Rack travel in mm : 2.00
Speed rpm : 410...440

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1150
Del.quantity cm3/ : 132.0...136.0
1000 s: (129.0...139.0)
Spread cm3 : 5.00
1000 s: (8.00)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.70
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 130.0...150.0
1000 s: (126.0...154.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,0 e 5
Edition : 12.12.89
Replaces : -
Test oil : ISO-4113

Combination no. : 0 401 846 818

Injection pump
Pump designation : PE6P120A320LS3810-10
EP type number : 0 411 826 734
Governor
Governor design. : RQV350...1150PA720-1
Governor no. : 0 421 813 539

Customer-spec. information
Customer : MERCEDES-BENZ

Engine : OM421A

1st version kW : 184.0
Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 100...120

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
x Wall thickness
x Length mm : 6,00X1,50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10
(3.95...4.15)
Rack travel in mm : 9.00...12.00
Firing order : 6-3-5-2-4-1

Phasing : 0-45-120-165-240-285
Tolerance + - , : 0,50 (0,75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 10.70...10.80

Del.quantity cm³/ : 15.8...16.0
100 s: (15.5...16.3)

Spread cm³ : 0.5
100 s: (0.9)

2nd speed rpm : 350
Rack travel in mm : 4.90...5.10
Del.quantity cm³/ : 1.6...2.2
100 s: (1.3...2.5)
Spread cm³ : 0.8
100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1250
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1150
Aneroid pressure h: 700
Del.quantity : 158.0...160.0
1000 : (155.0...163.0)
Spread cm³ : 5.0
1000 : (9.0)

RATED SPEED

1st version
Control lever
position degrees: 58...66

Testing:
1st rack travel in: 9.70

Speed rpm : 1175...1185
2nd rack travel in: 4.00
Speed rpm : 1260...1290
4th rack travel in: 1360
Speed rpm : 0.00...1.50

LOW IDLE 1

Control lever
position degrees: 7...15

Testing:

Speed rpm : 100
Minimum rack travel: 6.70
Speed rpm : 350
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 350...500

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 1150
Rack travel in m: 10.70...10.80
2nd speed rpm : 850
Rack travel in m: 11.00...11.20
3rd speed rpm : 950
Rack travel in m: 10.80...11.00

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.30...10.60

Measurement

Speed 1/min : 500

1st pressure hPa : 425

Rack travel in m: 10.50...10.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 600
Del.quantity cm³/ : 165.0...171.0
1000 s: (162.0...174.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: 700
Speed rpm : 1150
Del.quantity cm³/ : 128.0...131.0 *
1000 s: (125.0...134.0)

Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 141.0...143.0
1000 s: (138.0...146.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.70
Speed rpm : 1175...1185

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 150.0...170.0
1000 s: (146.0...174.0)

Remarks:

* = Set at reduced-delivery stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : ENA 11,9 c
Edition : 01.12.89
Replaces : 17.2.89
Test oil : ISO-4113

Combination no. : 0 401 846 860

Injection pump
Pump designation : PE6P120A320RS3200
EP type number : 0 411 826 766
Governor
Governor design. : RQV250...1000PA808-1
Governor no. : 0 421 813 660

Customer spec. information
Customer : ENASA

Engine : 96 R1 BX

1st version kW : 265.0
Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
x Wall thickness
x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.80...3.90
: (3.75...3.95)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 11.90...12.00

Del. quantity cm³/ : 24.9...25.1

100 s: (24.6...25.4)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 3.3...3.7

Del. quantity cm³/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.00...1.40

2nd speed rpm : 350

travel mm : 2.10...2.60

3rd speed rpm : 700

travel mm : 4.70...5.30

4th speed rpm : 1055

travel mm : 7.90...8.10

5th speed rpm : 1145

travel mm : 9.00...9.40

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1070

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1200

Del.quantity : 249.0...251.0
1000 : (246.0...254.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 50...58

Testing:
1st rack travel in: 10.90
Speed rpm : 1050...1060
2nd rack travel in: 4.00
Speed rpm : 1130...1160
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 8...16

Testing:
Speed rpm : 100
Minimum rack travel: 5.00
Speed rpm : 250
Rack travel in mm : 3.30...3.70

CONSTANT REGULATION
Speed rpm : 250...330

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 1200
Rack travel mm : 11.90...12.00

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 8.50...8.90
2nd pressure hPa : 680
Rack travel in m: 11.30...11.40
3rd pressure hPa : 420
Rack travel in m: 9.50...9.70

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 900
Del.quantity cm3/ : 240.0...246.0
1000 s: (237.0...249.0)

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 149.0...152.0
1000 s: (146.5...154.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.90
Speed rpm : 1050...1060

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 155.0...175.0
1000 s: (151.0...179.0)
Rack travel in mm : 19.50...21.00

Remarks:

Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : ENA 11,9 e
Edition : 01.12.89
Replaces : 17.2.89
Test oil : ISO-4113 .

Combination no. : 0 401 846 861

Injection pump
Pump designation : PE6P120A320RS3176-1
EP type number : 0 411 826 767
Governor
Governor design. : RQV250...1050PA808
Governor no. : 0 421 813 553

Customer-spec. information
Customer : ENASA

Engine : 96 R1 AX

1st version kW : 250.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.80...3.90
: (3.75...3.95)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 650

Rack travel in mm : 12.40...12.50

Del.quantity cm3/ : 21.2...21.4

100 s: (20.9...21.7)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 4.2...4.4

Del.quantity cm3/ : 2.5...3.1

100 s: (2.2...3.4)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.00...1.40

2nd speed rpm : 350

travel mm : 1.90...2.50

3rd speed rpm : 700

travel mm : 4.50...5.10

4th speed rpm : 1095

travel mm : 8.00...8.20

5th speed rpm : 1185

travel mm : 9.00...9.40

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1110

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 650

Aneroid pressure h: 900

Del.quantity : 212.0...214.0
1000 : (209.0...217.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 50...58

Testing:
1st rack travel in: 11.40
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1185...1215
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 11...19

Testing:
Speed rpm : 100
Minimum rack travel: 5.90
Speed rpm : 250
Rack travel in mm : 4.20...4.40

CONSTANT REGULATION
Speed rpm : 250...350

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 12.40...12.50

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.90...10.30
2nd pressure hPa : 390
Rack travel in m: 11.90...12.00
3rd pressure hPa : 160
Rack travel in m: 10.50...10.70

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 1030
Del.quantity cm3/ : 215.0...221.0
1000 s: (212.0...224.0)

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 151.0...153.0
1000 s: (148.0...156.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.40
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 155.0...175.0
1000 s: (151.0...179.0)
Rack travel in mm : 19.50...21.00

Remarks:

Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : ENA 11,9 d
Edition : 13.12.89
Replaces : 25.3.88
Test oil : ISO-4113

Combination no. : 0 401 846 862

Injection pump
Pump designation : PE6P110A320RS3201
EP type number : 0 411 816 753
Governor
Governor design. : RQ250/1050PA218-1
Governor no. : 0 421 801 406

Customer-spec. information
Customer : ENASA

Engine : 96 A4 AU

1st version kW : 150.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp., C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30
: (3.15...3.25)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 12.10...12.20

Del.quantity cm³/ : 12.6...12.8

100 s: (12.3...13.1)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 7.9...8.1

Del.quantity cm³/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm³ : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 15.60...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1030

Del.quantity : 126.0...128.0

1000 : (123.0...131.0)

Spread cm³ : 4.00

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 16.0

Testing:

1st rack travel in: 11.10

Speed rpm : 1095...1110

2nd rack travel in: 4.00

Speed rpm : 1140...1170

4th rack travel in: 1250

Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 250

Rack travel in mm : 6.0

Testing:

Speed rpm : 100

Minimum rack trave: 7.50

Speed rpm : 250

Rack travel in mm : 5.90...6.10

Rack travel in mm : 2.00

Speed rpm : 290...330

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.10

Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 143.0...163.0

1000 s: (139.0...167.0)

LOW IDLE

Speed rpm : 250

Rack travel in mm : 5.90...6.10

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : STE 10,0 g
Edition : 20.10.89
Replaces : -
Test oil : ISO-4113

Combination no. : 0 401 846 912

Injection pump
Pump designation : PE6P110A720RS3243
EP type number : 0 411 816 770
Governor
Governor design. : RQ300/1100PA412-4
Governor no. : 0 421 801 496

Customer-spec. information
Customer : STEYR

Engine : WD615.68

1st version kW : 228.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00x1.50x600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
: (2.75...2.95)
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.70...13.80

Del.quantity cm³/ : 18.3...18.5

100 s: (18.0...18.8)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 3.9...4.1

Del.quantity cm³/ : 1.5...2.1

100 s: (1.2...2.4)

Spread cm³ : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 15.60...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 183.0...185.0

1000 : (180.0...188.0)

Spread cm³ : 4.00

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 16.0

Testing:

1st rack travel in: 12.70

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1240...1270

4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 4.0

Testing:

Speed rpm : 100
Minimum rack travel: 5.50
Speed rpm : 300
Rack travel in mm : 3.90...4.10
Rack travel in mm : 2.00
Speed rpm : 350...390

TORQUE CONTROL

Dimension a mm : -

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 1200
Rack travel mm : 13.70...13.80

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.00...10.20
2nd pressure hPa : 630
Rack travel in m: 12.90...13.00
3rd pressure hPa : 375
Rack travel in m: 10.90...11.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 700
Del.quantity cm3/ : 193.0...197.0
1000 s: (190.0...200.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 119.0...121.0
1000 s: (116.0...124.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.70
Speed rpm : 1145...1160

M05

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 225.0...265.0
1000 s: (221.0...269.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 3.90...4.10
Del.quantity cm3/ : 15.0...21.0
1000 s: (12.0...24.0)
Spread cm3 : 4.50
1000 s: (7.50)

Remarks:

:

Delivery-valve spring pre-tension =
2.40...2.60 mm.
Permissible alteration from 2.20...2.90
mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : STE 10,0 h
Edition : 20.10.89
Replaces : -
Test oil : ISO-4113
Combination no. : 0 401 846 913
Injection pump
Pump designation : PE6P110A720RS3243
EP type number : 0 411 816 770
Governor
Governor design. : RGV250...1100PA413-5
Governor no. : 0 421 813 811

Customer-spec. information
Customer : STEYR

Engine : WD615.68

1st version kW : 228.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.70...13.80

Del.quantity cm³/ : 18.3...18.5

100 s: (18.0...18.8)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 4.4...4.6

Del.quantity cm³/ : 1.5...2.1

100 s: (1.2...2.4)

Spread cm³ : 0.4

100 s: (0.7)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
travel mm : 0.90...1.30

2nd speed rpm : 350
travel mm : 1.70...2.30

3rd speed rpm : 700
travel mm : 4.40...5.00

4th speed rpm : 1145
travel mm : 8.30...8.50

5th speed rpm : 1250
travel mm : 9.50...9.90

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 183.0...185.0

1000 : (180.0...188.0)

Spread cm3 : 4.00
1000 : (7.50)

RATED SPEED

1st version
Control lever
position degrees: 45...53

Testing:

1st rack travel in: 12.70
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1240...1270
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 10...18

Testing:

Speed rpm : 100
Minimum rack travel: 6.00
Speed rpm : 250
Rack travel in mm : 4.40...4.60

CONSTANT REGULATION

Speed rpm : 250...350

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : 1200
Rack travel mm : 13.70...13.80

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 10.00...10.20

2nd pressure hPa : 630

Rack travel in m: 12.90...13.00

3rd pressure hPa : 375

Rack travel in m: 10.90...11.10

START CUT-OUT

Speed 1/min : 170 (190)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 700

Del.quantity cm3/ : 193.0...197.0
1000 s: (190.0...200.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 119.0...121.0
1000 s: (116.0...124.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.70

Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 225.0...265.0
1000 s: (221.0...269.0)

Remarks:

Delivery-valve spring pre-tension =
2.40...2.60 mm.

Permissible alteration from 2.20...2.90
mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : ENA 12,9 a
Edition : 01.12.89
Replaces : -
Test oil : ISO-4113
Combination no. : 0 401 846 915
Injection pump
Pump designation : PE6P120A32ORS3244
EP type number : 0 411 826 788
Governor
Governor design. : RGV250...1050PA808-4
Governor no. : 0 421 813 821

Customer-spec. information
Customer : ENASA

Engine : 98 R1 AX

1st version kW : 331.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.30...3.40
: (3.25...3.45)
Rack travel in mm : 9.00...12.00
Firing order : 1-5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 13.10...13.20

Del.quantity cm3/ : 28.7...28.9

100 s: (28.4...29.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Del.quantity cm3/ : 2.5...3.1

100 s: (2.2...3.4)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.00...1.40

2nd speed rpm : 350

travel mm : 1.90...2.50

3rd speed rpm : 700

travel mm : 4.50...5.10

4th speed rpm : 1095

travel mm : 8.00...8.20

5th speed rpm : 1185

travel mm : 9.00...9.40

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1110

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Aneroid pressure h: 1200

Del.quantity : 287.0...289.0
1000 : (284.0...292.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 51...59

Testing:
1st rack travel in: 12.10
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1185...1215
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 13...21

Testing:
Speed rpm : 100
Minimum rack travel: 7.50
Speed rpm : 250
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION
Speed rpm : 250...430

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 1200
Rack travel mm : 13.10...13.20

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.90...11.30
2nd pressure hPa : 770
Rack travel in m: 12.60...12.70
3rd pressure hPa : 590
Rack travel in m: 11.60...11.80

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 1030
Del.quantity cm3/ : 275.0...281.0
1000 s: (272.0...284.0)

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 217.0...219.0
1000 s: (214.0...222.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.10
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 150.0...170.0
1000 s: (150.0...170.0)
Rack travel in mm : 19.50...21.00

Remarks:

Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,
the start position must be reached.

APPLICATION

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 i
 Edition : 24.11.89
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 401 846 917
 Injection pump
 Pump designation : PE6P120A32ORS3183
 EP type number : 0 411 826 754
 Governor
 Governor design. : RQV250...1000PA851-4
 Governor no. : 0 421 813 828

Customer-spec. information
 Customer : DAF

Engine : WS 268

1st version kW : 268.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80
 : (3.65...3.85)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 20.9...21.1

100 s: (20.6...21.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 6.5...6.7

Del.quantity cm3/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
 travel mm : 1.40...1.60

2nd speed rpm : 400
 travel mm : 3.20...3.60

3rd speed rpm : 800
 travel mm : 5.80...6.20

4th speed rpm : 1000
 travel mm : 7.90...8.10

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1025

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del.quantity : 209.0...211.0

1000 : (206.0...214.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 117...125

Testing:

1st rack travel in: 11.50

Speed rpm : 1040...1050

2nd rack travel in: 4.00

Speed rpm : 1130...1160

4th rack travel in: 1250

Speed rpm : 0.00...1.40

LOW IDLE 1

Control lever

position degrees: 82...90

Testing:

Speed rpm : 100

Minimum rack travel: 7.50

Speed rpm : 250

Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

Speed rpm : 275...385

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 600

Pressure hPa : 1000

Rack travel mm : 12.50...12.60

Measurement

Speed 1/min : 600

1st pressure hPa : -

Rack travel in m: 11.00...11.20

2nd pressure hPa : 470

Rack travel in m: 12.10...12.20

3rd pressure hPa : 380

Rack travel in m: 11.40...11.60

START CUT-OUT

Speed 1/min : 200 (0)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 600

Del.quantity cm³/ : 164.0...166.0

1000 s: (161.0...169.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.50

Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm³/ : 260.0...300.0

1000 s: (256.0...304.0)

LOW IDLE

Speed rpm : 250

Rack travel in mm : 6.50...6.70

Del.quantity cm³/ : 14.0...20.0

1000 s: (11.0...23.0)

Spread cm³ : 8.00

1000 s: (12.00)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL 12,2 e
Edition : 01.12.89
Replaces : -
Test oil : ISO-4113
Combination no. : 0 401 846 919
Injection pump
Pump designation : PE6P120A320RS3118-7
EP type number : 0 411 826 790
Governor
Governor design. : RQV250...950PA921-20
Governor no. : 0 421 813 838

Customer-spec. information
Customer : VOLVO-TRUCK

Engine : TD122FTQ

1st version kW : 221.0
Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
inlet temp., C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.60...2.70
: (2.55...2.75)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + -, : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 11.30...11.40

Del.quantity cm3/ : 19.4...19.6

100 s: (19.1...19.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0
Rack travel in mm : 3.3...3.5
Del.quantity cm3/ : 1.8...2.3
100 s: (1.5...2.5)

Spread cm3 : 0.5
100 s: (0.7)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
travel mm : 1.00...1.40
2nd speed rpm : 350
travel mm : 2.20...2.80
3rd speed rpm : 750
travel mm : 6.30...6.70
4th speed rpm : 995
travel mm : 8.20...8.40
5th speed rpm : 1060
travel mm : 9.30...9.70

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 990
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 700
Aneroid pressure h: 900

Del.quantity : 194.0...196.0
1000 : (191.0...199.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control Lever
position degrees: 60...68

Testing:
1st rack travel in: 10.30
Speed rpm : 990...1000
2nd rack travel in: 4.00
Speed rpm : 1035...1065
4th rack travel in: 1150
Speed rpm : 0.00...1.00

LOW IDLE 1
Control Lever
position degrees: 3...11

Testing:
Speed rpm : 100
Minimum rack travel: 4.80
Speed rpm : 250
Rack travel in mm : 3.30...3.50

CONSTANT REGULATION
Speed rpm : 250...350

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 11.30...11.40

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.00...9.20
2nd pressure hPa : 85
Rack travel in m: 9.20...9.30

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: -
Speed rpm : 700
Del.quantity cm3/ : 149.0...151.0
1000 s: (146.0...154.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.30
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 240.0...280.0
1000 s: (236.0...284.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250
Rack travel in mm : 3.30...3.50
Del.quantity cm3/ : 18.0...23.0
1000 s: (15.5...25.5)
Spread cm3 : 5.00
1000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension =
2.40...2.60 mm.
Permissible alteration from 2.20...2.90
mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL 12,2 e1
 Edition : 01.12.89
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 401 846 920
 Injection pump
 Pump designation : PE6P120A32ORS3118-8
 EP type number : 0 411 826 791
 Governor
 Governor design. : RQV250...950PA921-21
 Governor no. : 0 421 813 839

Customer-spec. information
 Customer : VOLVO-TRUCK

Engine : TD122FKQ

1st version kW : 254.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.60...2.70
 : (2.55...2.75)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.20...13.30

Del.quantity cm3/ : 23.4...23.6

100 s: (23.1...23.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 3.3...3.5

Del.quantity cm3/ : 1.8...2.3

100 s: (1.5...2.5)

Spread cm3 : 0.5

100 s: (0.7)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.00...1.40

2nd speed rpm : 350

travel mm : 2.20...2.80

3rd speed rpm : 750

travel mm : 6.30...6.70

4th speed rpm : 995

travel mm : 8.20...8.40

5th speed rpm : 1060

travel mm : 9.30...9.70

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 990

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 234.5...236.5
1000 : (231.5...239.5)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control Lever
position degrees: 61...69

Testing:
1st rack travel in: 12.20
Speed rpm : 990...1000
2nd rack travel in: 4.00
Speed rpm : 1050...1080
4th rack travel in: 1150
Speed rpm : 0.00...1.00

LOW IDLE 1
Control Lever
position degrees: 3...11

Testing:
Speed rpm : 100
Minimum rack travel: 4.80
Speed rpm : 250
Rack travel in mm : 3.30...3.50

CONSTANT REGULATION
Speed rpm : 250...350

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 13.20...13.30

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.00...9.20
2nd pressure hPa : 85
Rack travel in m: 9.20...9.30

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: -
Speed rpm : 700
Del.quantity cm³/ : 149.0...151.0
1000 s: (146.0...154.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 12.20
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 240.0...280.0
1000 s: (236.0...284.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250
Rack travel in mm : 3.30...3.50
Del.quantity cm³/ : 18.0...23.0
1000 s: (15.5...25.5)
Spread cm³ : 5.00
1000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension =
2.40...2.60 mm.
Permissible alteration from 2.20...2.90
mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 12,8 a
 Edition : 24.11.89
 Replaces : 12.9.86
 Test oil : ISO-4113
 Combination no. : 0 401 848 780
 Injection pump
 Pump designation : PE8P120A920/5LS3174
 EP type number : 0 411 828 719
 Governor
 Governor design. : RQV300...1150PA802
 Governor no. : 0 421 813 538

Customer-spec. information
 Customer : KHD

Engine : BF8L513C

1st version kW : 265.0
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60
 : (3.45...3.65)
 Rack travel in mm : 15.00...19.00
 Firing order : 1- 8- 7- 2- 6- 5-
 4- 3

Phasing : 0-45-90-135-180-225-
 270-315
 Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 13.20...13.30

Del. quantity cm³/ : 16.6...16.8
 100 s: (16.3...17.1)

Spread cm³ : 0.6
 100 s: (1.0)

2nd speed rpm : 300.0
 Rack travel in mm : 7.1...7.3
 Del. quantity cm³/ : 2.0...2.6
 100 s: (1.7...2.9)
 Spread cm³ : 0.9
 100 s: (1.3)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
 travel mm : 1.00...1.40
 2nd speed rpm : 400
 travel mm : 2.20...2.80
 3rd speed rpm : 550
 travel mm : 3.50...4.10
 4th speed rpm : 1200
 travel mm : 8.20...8.40
 5th speed rpm : 1285
 travel mm : 9.00...9.40

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1220
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1150

Aneroid pressure h: 900
Del.quantity : 166.0...168.0
1000 : (163.0...171.0)
Spread cm3 : 6.00
1000 : (10.00)

RATED SPEED

1st version
Control lever
position degrees: 50...58

Testing:
1st rack travel in: 12.20
Speed rpm : 1190...1200
2nd rack travel in: 4.00
Speed rpm : 1310...1340
4th rack travel in: 1450
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 15...23

Testing:
Speed rpm : 100
Minimum rack trave: 8.80
Speed rpm : 300
Rack travel in mm : 7.10...7.30

CONSTANT REGULATION
Speed rpm : 300...510

TORQUE CONTROL
Dimension a mm : 0.40
Torque control curve - 1st version
1st speed rpm : 1150
Rack travel in m: 13.20...13.30
2nd speed rpm : 700
Rack travel in m: 13.50...13.70

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 13.40...13.60

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 12.30...12.50
2nd pressure hPa : 500
Rack travel in m: 13.10...13.20

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 700
Del.quantity cm3/ : 167.0...171.0
1000 s: (164.0...174.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 134.0...136.0
1000 s: (131.0...139.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.20
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 170.0...190.0

Remarks:

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,
the start position must be reached.

APPLICATION

Special-purpose vehicle

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 d 7
 Edition : 03.11.89
 Replaces : 28.11.88
 Test oil : ISO-4113
 Combination no. : 0 401 848 800
 Injection pump
 Pump designation : PE8P110A320LS3842-1
 EP type number : 0 411 818 716
 Governor
 Governor design. : RQV350..1050PA378-7
 Governor no. : 0 421 813 714

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM442

1st version kW : 213.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10
 : (3.95...4.15)
 Rack travel in mm : 9.00...12.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315
 Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 12.70...12.80

Del.quantity cm³/ : 12.4...12.6

100 s: (12.1...12.8)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 350.0

Rack travel in mm : 8.0...8.3

Del.quantity cm³/ : 1.5...2.1

100 s: (1.2...2.3)

Spread cm³ : 0.4

100 s: (0.7)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.50...1.70

2nd speed rpm : 800

travel mm : 4.90...5.30

3rd speed rpm : 1100

travel mm : 7.90...8.50

4th speed rpm : 1150

travel mm : 8.90...9.70

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1110

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Del.quantity : 124.0...126.0

1000 : (121.5...128.5)

Spread cm³ : 4.00
 1000 : (7.00)

RATED SPEED

1st version
Control lever
position degrees: 56...64

Testing:
1st rack travel in: 11.70
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1140...1170
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 10...18

Testing:
Speed rpm : 250
Minimum rack trave: 9.50
Speed rpm : 350
Rack travel in mm : 8.00...8.30

CONSTANT REGULATION
Speed rpm : 350...450

START CUT-OUT

Speed 1/min : 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 1050
Del.quantity cm³/ : 137.0...141.0
 1000 s: (134.0...144.0)
Spread cm³ : 5.00
 1000 s: (8.00)
Speed rpm : 1050
Del.quantity cm³/ : 87.0...89.0 *
 1000 s: (84.0...92.0)
Spread cm³ : 6.00
 1000 s: (9.00)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.70
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 140.0...160.0
 1000 s: (136.0...164.0)

Remarks:

:

* = Set at reduced-delivery stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : BAO 21,2 b1
 Edition : 02.10.89
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 401 848 807
 Injection pump
 Pump designation : PE8P130A520/4RS3126
 EP type number : 0 411 838 707
 Governor
 Governor design. : RQV400...750PA934-1
 Governor no. : 0 421 813 817

Customer-spec. information
 Customer : BAUDOUIN

Engine : 8P15

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 074

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 4- 5- 6- 3-
 7- 8

Phasing : 0-45-90-135-180-225-
 270-315

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 9.30...9.40

Del.quantity cm3/ : 19.2...19.5

100 s: (18.8...19.8)

Spread cm3 : 0.6

100 s: (1.0)

2nd speed rpm : 400.0

Rack travel in mm : 4.9...5.1

Del.quantity cm3/ : 2.3...2.9

100 s: (1.9...3.3)

Spread cm3 : 1.0

100 s: (1.4)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 400

travel mm : 0.90...1.10

2nd speed rpm : 475

travel mm : 1.90...2.10

3rd speed rpm : 600

travel mm : 1.90...2.10

4th speed rpm : 750

travel mm : 5.00...6.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 192.0...195.0

1000 : (188.5...198.5)

Spread cm3 : 6.00

1000 : (10.00)

RATED SPEED

1st version

Control lever

position degrees: 46...54

Testing:

1st rack travel in: 8.30

Speed rpm : 750...755

2nd rack travel in: 4.00

Speed rpm : 770...780

4th rack travel in: 900

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 18...26

Testing:

Speed rpm : 100

Minimum rack travel: 6.50

Speed rpm : 400

Rack travel in mm : 4.90...5.10

START CUT-OUT

Speed 1/min : 340 (360)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.30

Speed rpm : 750...755

Remarks:

:

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

APPLICATION

Generator

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 16,0 d4
 Edition : 02.10.89
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 401 849 730
 Injection pump
 Pump designation : PE10P110A920/5LS3164
 EP type number : 0 411 819 708
 Governor
 Governor design. : RQV300...1075PA821
 Governor no. : 0 421 813 562

Customer-spec. information
 Customer : KHD

Engine : BF10L513

1st version kW : 250.0
 Rated speed : 2150

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 10- 9- 4- 3- 6-
 5- 8- 7- 2

Phasing : 0-27-72-99-144-171-
 216-243-288-315

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1075

Rack travel in mm : 11.20...11.30

Del.quantity cm³/ : 12.4...12.6

100 s: (12.1...12.9)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 7.0...7.2

Del.quantity cm³/ : 1.2...1.8

100 s: (0.9...2.1)

Spread cm³ : 0.4

100 s: (0.7)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
 travel mm : 1.00...1.40

2nd speed rpm : 450
 travel mm : 2.90...3.40

3rd speed rpm : 800
 travel mm : 5.00...5.50

4th speed rpm : 1100
 travel mm : 8.00...8.20

5th speed rpm : 1200
 travel mm : 9.10...9.50

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1120

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1075

Aneroid pressure h: 750

Del.quantity : 124.0...126.0

1000 : (121.0...129.0)

Spread cm3 : 4.00
1000 : (7.50)

RATED SPEED

1st version
Control lever
position degrees: 50...58

Testing:
1st rack travel in: 10.20
Speed rpm : 1105...1115
2nd rack travel in: 4.00
Speed rpm : 1200...1230
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 14...22

Testing:
Speed rpm : 100
Minimum rack travel: 8.50
Speed rpm : 300
Rack travel in mm : 7.00...7.20

CONSTANT REGULATION
Speed rpm : 300...440

TORQUE CONTROL
Dimension a mm : 0.40
Torque control curve - 1st version
1st speed rpm : 650
Rack travel in m: 11.40...11.50
2nd speed rpm : 1075
Rack travel in m: 11.20...11.30
3rd speed rpm : 940
Rack travel in m: 11.30...11.40

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 750
Rack travel mm : 11.40...11.50

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 11.10...11.20
2nd pressure hPa : 400
Rack travel in m: 11.30...11.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 750
Speed rpm : 650
Del.quantity cm3/ : 128.0...132.0
1000 s: (125.0...135.0)
Aneroid pressure h: -
Speed rpm : 450
Del.quantity cm3/ : 112.0...116.0
1000 s: (110.0...118.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.20
Speed rpm : 1105...1115

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 135.0...165.0

Remarks:

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 18,2 f
 Edition : 02.10.89
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 401 849 744
 Injection pump
 Pump designation : PE10P120A520/4LS3849
 EP type number : 0 411 829 708
 Governor
 Governor design. : RQ750PA663-7
 Governor no. : 0 421 801 331

Customer-spec. information
 Customer : MAN

Engine : D2840 LE

1st version kW : 405.0
 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.20...4.30
 : (4.15...4.35)
 Rack travel in mm : 9.00...12.00
 Firing order : 10- 9- 4- 1- 8- 7
 - 6- 3- 5- 2

Phasing : 0-45-72-117-144-189-
 216-261-288-333
 Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 10

BASIC SETTING

1st speed rpm : 700
 Rack travel in mm : 12.50...12.60
 Del.quantity cm3/ : 23.6...23.8
 100 s: (23.3...24.1)
 Spread cm3 : 0.5
 100 s: (0.9)

2nd speed rpm : 300.0
 Rack travel in mm : 4.5...4.9
 Del.quantity cm3/ : 1.7...2.3
 100 s: (1.4...2.6)
 Spread cm3 : 0.8
 100 s: (1.2)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700
 Del.quantity : 236.0...238.0
 1000 : (233.0...241.0)
 Spread cm3 : 5.00
 1000 : (9.00)

RATED SPEED

1st version

Testing:
 1st rack travel in: 11.30
 Speed rpm : 750...755
 2nd rack travel in: 4.00
 Speed rpm : 790...803
 4th rack travel in: 950
 Speed rpm : 0.00...1.00

STARTING FUEL DELIVERY

Speed rpm : 100

Remarks: : MAN-NR. 2-7975

APPLICATION

Generator set

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 18,2 g
 Edition : 09.11.89
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 401 849 746
 Injection pump
 Pump designation : PE10P120A520/4LS3855
 EP type number : 0 411 829 709
 Governor
 Governor design. : RQV300...1000PA838
 Governor no. : 0 421 813 585

Customer-spec. information
 Customer : MAN

Engine : D2840LF/460

1st version kW : 338.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.90...4.00
 : (3.85...4.05)
 Rack travel in mm : 9.00...12.00
 Firing order : 10- 9- 4- 1- 8- 7
 - 6- 3- 5- 2

Phasing : 0-45-72-117-144-189-
 216-261-288-333
 Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 10

BASIC SETTING

1st speed rpm : 1000
 Rack travel in mm : 11.30...11.40
 Del.quantity cm3/ : 20.4...20.6
 100 s: (20.1...20.9)
 Spread cm3 : 0.5
 100 s: (0.9)

2nd speed rpm : 300.0
 Rack travel in mm : 6.0...6.2
 Del.quantity cm3/ : 1.7...2.3
 100 s: (1.4...2.6)
 Spread cm3 : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
 travel mm : 1.00...1.40
 2nd speed rpm : 500
 travel mm : 3.10...3.50
 3rd speed rpm : 850
 travel mm : 6.60...6.90
 4th speed rpm : 1000
 travel mm : 7.70...7.90

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1150
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1000
 Aneroid pressure h: 1003

Del.quantity : 204.0...206.0
1000 : (201.0...209.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 49...57

Testing:
1st rack travel in: 10.30
Speed rpm : 1040...1050
2nd rack travel in: 4.00
Speed rpm : 1115...1145
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 13...21

Testing:
Speed rpm : 100
Minimum rack travel: 7.60
Speed rpm : 300
Rack travel in mm : 6.00...6.20

CONSTANT REGULATION
Speed rpm : 335...445

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 1000
Rack travel mm : 11.30...11.40

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.10...10.20
2nd pressure hPa : 380
Rack travel in m: 10.40...10.50
3rd pressure hPa : 500
Rack travel in m: 10.90...11.10

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

M27

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 144.0...146.0
1000 s: (141.0...149.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.30
Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 190.0...210.0
1000 s: (186.0...214.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.00...6.20
Del.quantity cm3/ : 17.0...23.0
1000 s: (14.0...26.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:
: MAN-NR. 2-7779

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 18,2 f1
 Edition : 02.01.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 401 849 748
 Injection pump
 Pump designation : PE10P120A520/4LS3849
 EP type number : 0 411 829 708
 Governor
 Governor design. : RQ750PA947
 Governor no. : 0 421 801 513

Customer-spec. information
 Customer : MAN

Engine : D2840 LE

1st version kW : 352.0
 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.20...4.30
 : (4.15...4.35)
 Rack travel in mm : 9.00...12.00
 Firing order : 10- 9- 4- 1- 8- 7
 - 6- 3- 5- 2

Phasing : 0-45-72-117-144-189-
 216-261-288-333
 Tolerance + - : 0.50 (0.75)

Time to cyl. no. : 10

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.30...12.40

Del.quantity cm3/ : 22.9...23.1

100 s: (22.6...23.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.3...4.7

Del.quantity cm3/ : 1.4...2.0
 100 s: (1.1...2.3)

Spread cm3 : 0.8
 100 s: (1.2)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700
 Del.quantity : 229.0...231.0
 1000 : (226.0...234.0)
 Spread cm3 : 5.00
 1000 : (9.00)

RATED SPEED

1st version

Testing:
 1st rack travel in: 11.30
 Speed rpm : 750...755
 2nd rack travel in: 4.00
 Speed rpm : 790...803
 4th rack travel in: 950
 Speed rpm : 0.00...1.00

Remarks:

: MAN-NR. 2-7975

APPLICATION

Generator set



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : STE 9,7 b 1
 Edition : 08.09.89
 Replaces : 12.9.86
 Test oil : ISO-4113
 Combination no. : 0 401 856 700
 Injection pump
 Pump designation : PE6P110A721RS3101
 EP type number : 0 411 816 725
 Governor
 Governor design. : RQ300/1200PA412
 Governor no. : 0 421 801 172

Customer-spec. information
 Customer : STEYR

Engine : WD615.67

1st version kW : 206.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00

NO2

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1200
 Rack travel in mm : 12.00...12.10
 Del.quantity cm³/ : 16.2...16.4
 100 s: (15.9...16.7)
 Spread cm³ : 0.4
 100 s: (0.7)

2nd speed rpm : 300.0
 Rack travel in mm : 5.9...6.1
 Del.quantity cm³/ : 1.2...1.8
 100 s: (0.9...2.0)
 Spread cm³ : 0.4
 100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 600
 Rack travel in mm : 15.60...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1200
 Aneroid pressure h: 700
 Del.quantity : 162.0...164.0
 1000 : (159.0...167.0)
 Spread cm³ : 4.00
 1000 : (7.50)

RATED SPEED

1st version
 Setting point:
 Speed rpm : 600
 Rack travel in mm : 16.0

Testing:
 1st rack travel in: 11.00
 Speed rpm : 1245...1260
 2nd rack travel in: 4.00
 Speed rpm : 1325...1355

4th rack travel in: 1450
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.0

Testing:

Speed rpm : 100
Minimum rack travel: 7.50
Speed rpm : 300
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00
Speed rpm : 405...445

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 1200
Rack travel in m: 12.00...12.10
2nd speed rpm : 600
Rack travel in m: 12.40...12.70
3rd speed rpm : 985
Rack travel in m: 12.30...12.50
4th speed rpm : 1075
Rack travel in m: 12.20...12.40

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 700
Rack travel mm : 12.40...12.60

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.80...10.00
2nd pressure hPa : 420
Rack travel in m: 11.50...11.60
3rd pressure hPa : 330
Rack travel in m: 10.20...10.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 700
Del.quantity cm³/ : 165.0...169.0
1000 s: (163.0...171.0)
Aneroid pressure h: -
Speed rpm : 700
Del.quantity cm³/ : 120.0...122.0
1000 s: (117.0...125.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.00
Speed rpm : 1245...1260

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 205.0...235.0
1000 s: (201.0...239.0)
Rack travel in mm : 18.80...19.20

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 21,9 s
Edition : 15.08.89
Replaces : 12.9.86
Test oil : ISO-4113

Combination no. : 0 401 870 704

Injection pump
Pump designation : PE12P120A320LS3836-1
EP type number : 0 411 820 718
Governor
Governor design. : RSV350...750POA824-6
Governor no. : 0 421 833 232

Customer-spec. information
Customer : DAIMLER-BENZ

Engine : OM 424 A

1st version kW : 348.0
Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 150...170

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10
: (3.95...4.15)
Rack travel in mm : 9.00...12.00
Firing order : 12- 1- 5- 9- 8- 3-
4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-
180-225-240-285-300-
345

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 11.90...12.00

Del.quantity cm³/ : 19.3...19.5

100 s: (19.0...19.8)

Spread cm³ : 0.5

100 s: (0.8)

2nd speed rpm : 350.0

Rack travel in mm : 4.2...4.8

Del.quantity cm³/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm³ : 0.8

100 s: (1.2)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 193.0...195.0

1000 : (190.0...198.0)

Spread cm³ : 5.00

1000 : (8.00)

RATED SPEED

1st version

Control lever

position degrees: 27...35

Testing:

1st rack travel in: 10.90

Speed rpm : 750...755

2nd rack travel in: 4.00

Speed rpm : 775...788

4th rack travel in: 900

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 8...16

Setting point w/out bumper spring

Speed rpm : 350

Rack travel in mm : 4.5

Testing:

Speed rpm : 100

Minimum rack trave: 17.50

Speed rpm : 350

Rack travel in mm : 4.20...4.80

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.90

Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 170.0...190.0

1000 s: (166.0...194.0)

Remarks:

:

Observe VDT-I-420/120

APPLICATION

Generator

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 8,3 o11
 Edition : 20.06.89
 Replaces : 21.4.89
 Test oil : ISO-4113
 Combination no. : 0 401 876 316
 Injection pump
 Pump designation : PE6P100A72ORS447
 EP type number : 0 411 806 191
 Governor
 Governor design. : RSV250...1200P5A509-
 1
 Governor no. : 0 421 833 199

Customer-spec. information
 Customer : DAF

Engine : DHT 825

1st version kW : 162.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00
 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.30 (0.75)

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.40...11.50

Del.quantity cm3/ : 11.8...12.0

100 s: (11.6...12.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 5.2...5.4

Del.quantity cm3/ : 0.8...1.2

100 s: (0.5...1.4)

Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 700

Del.quantity : 118.5...120.5

1000 : (116.5...122.5)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 58...66

Testing:

1st rack travel in: 10.40

Speed rpm : 1240...1250

2nd rack travel in: 4.00

Speed rpm : 1300...1330

3rd rack travel in: 4.00
Speed rpm : 1325...1355
4th rack travel in: 1530
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 22...30
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 4.8
Speed rpm : 250
Rack travel in mm : 5.20...5.40
Rack travel in mm : 2.00
Speed rpm : 540...640

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1000
Rack travel in m: 11.60...11.70
2nd speed rpm : 400
Rack travel in m: 11.60...11.80
3rd speed rpm : 300
Rack travel in m: 11.90...12.40

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 600
Pressure hPa : 700
Rack travel mm : 11.40...11.50

Measurement

Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 10.40...10.60
2nd pressure hPa : 315
Rack travel in m: 11.10...11.20
3rd pressure hPa : 225
Rack travel in m: 10.50...10.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -
Speed rpm : 600
Del.quantity cm3/ : 92.5...96.5
1000 s: (90.0...99.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.40
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 210.0...230.0
1000 s: (206.0...234.0)
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.20...5.40
Del.quantity cm3/ : 8.0...12.0
1000 s: (5.5...14.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL 7,1 c
Edition : 15.08.89
Replaces : 24.2.89
Test oil : ISO-4113

Combination no. : 0 401 876 321

Injection pump
Pump designation : PE6P110A320RS497
EP type number : 0 411 816 165
Governor
Governor design. : RSV200...1200P1A374-
1
Governor no. : 0 421 833 204

Customer-spec. information
Customer : VOLVO

Engine : TD71A

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY
Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10
: (2.95...3.15)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 11.80...11.90

Del.quantity cm3/ : 11.6...11.8

100 s : (11.3...12.1)

Spread cm3 : 0.4

100 s : (0.7)

2nd speed rpm : 200.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 1.6...2.2

100 s : (-)

Spread cm3 : 0.3

100 s : (0.6)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 116.0...118.0

1000 : (113.0...121.0)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever

position degrees: 51...59

Testing:

1st rack travel in: 10.80

Speed rpm : 1210...1220

2nd rack travel in: 4.00

Speed rpm : 1240...1270

4th rack travel in: 1410

Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever

position degrees: 13...21

Setting point w/out bumper spring

Speed rpm : 200

Rack travel in mm : 5.0

Speed rpm : 200

Rack travel in mm : 5.40...5.60

Rack travel in mm : 2.00

Speed rpm : 280...340

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 900

Rack travel mm : 11.80...11.90

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 9.80...10.00

2nd pressure hPa : 675

Rack travel in m: 11.60...11.70

3rd pressure hPa : 200

Rack travel in m: 10.10...10.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 700

Del.quantity cm³/ : 82.0...85.0

1000 s: (79.0...88.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.80

Speed rpm : 1210...1220

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm³/ : 195.0...225.0

1000 s: (191.0...229.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

NO9

Speed rpm : 200

Rack travel in mm : 5.40...5.60

Del.quantity cm³/ : 16.0...22.0

Spread cm³ : 3.00

1000 s: (6.00)

Remarks:

:

Delivery-valve spring pre-tension =

2.40...2.60 mm.

Permissible alteration from 2.20...2.90 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL 7,1 c 1
 Edition : 02.10.89
 Replaces : 9.12.88
 Test oil : ISO-4113

Combination no. : 0 401 876 322

Injection pump
 Pump designation : PE6P110A320RS497
 EP type number : 0 411 816 165
 Governor
 Governor design. : RSV200...1200P1A374-
 2
 Governor no. : 0 421 833 205

Customer-spec. information
 Customer : VOLVO

Engine : TJD71A

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10
 : (2.95...3.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 11.70...11.80

Del. quantity cm³/ : 11.6...11.8
 100 s: (11.3...12.1)

Spread cm³ : 0.4
 100 s: (0.7)

2nd speed rpm : 200.0
 Rack travel in mm : 5.2...5.4
 Del. quantity cm³/ : 1.6...2.2
 100 s: (-)
 Spread cm³ : 0.3
 100 s: (0.6)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del. quantity : 116.0...118.0
 1000 : (113.0...121.0)

Spread cm³ : 4.00
 1000 : (7.50)

RATED SPEED

1st version

Control lever
 position degrees: 54...62

Testing:

1st rack travel in: 10.70
 Speed rpm : 1240...1250

2nd rack travel in: 4.00
 Speed rpm : 1290...1320

4th rack travel in: 1420
 Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 13...21
Setting point w/out bumper spring
Speed rpm : 200
Rack travel in mm : 4.8
Speed rpm : 200
Rack travel in mm : 4.70...4.90
Rack travel in mm : 2.00
Speed rpm : 280...340

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 11.70...11.80

Measurement
Speed 1/min : 500
Rack travel in m: 8.80...9.00
2nd pressure hPa : 800
Rack travel in m: 11.60...11.70
3rd pressure hPa : 270
Rack travel in m: 8.90...9.30

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 700
Del.quantity cm3/ : 66.0...68.0
1000 s: (63.0...71.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.70
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 185.0...215.0
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 200
Rack travel in mm : 5.20...5.40
Del.quantity cm3/ : 16.0...22.0
Spread cm3 : 3.00
1000 s: (6.00)

Remarks:

:
Delivery-valve spring pre-tension =
2.40...2.60 mm.
Permissible alteration from 2.20...2.90
mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : ENA 10,1 f
 Edition : 13.12.89
 Replaces : 24.2.89
 Test oil : ISO-4113
 Combination no. : 0 401 876 332
 Injection pump
 Pump designation : PE6P100A820LS130
 EP type number : 0 411 806 179
 Governor
 Governor design. : RSV250...1000P1A532
 Governor no. : 0 421 833 273

Customer-spec. information
 Customer : ENASA

Engine : 9105.42.25.21

1st version kW : 113.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 11.90...12.00

Del.quantity cm³/ : 11.3...11.5

100 s: (11.1...11.7)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 7.9...8.1

Del.quantity cm³/ : 1.8...2.2

100 s: (1.5...2.4)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Del.quantity : 113.0...115.0

1000 : (111.0...117.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 34...42

Testing:

1st rack travel in: 10.90

Speed rpm : 790...800

2nd rack travel in: 4.00

Speed rpm : 815...845

3rd rack travel in: 4.00
Speed rpm : 815...845
4th rack travel in: 1000
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 13...21
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 5.5

Testing:

Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 250
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00
Speed rpm : 330...390

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 750
Rack travel in m: 11.90...12.00
2nd speed rpm : 450
Rack travel in m: 11.90...12.00
3rd speed rpm : 300
Rack travel in m: 13.20...13.80

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.90
Speed rpm : 790...800

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 260.0...280.0
1000 s: (256.0...284.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.90...6.10

Remarks:

:

APPLICATION

Generator set

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : ENA 10,1f16
 Edition : 02.10.89
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 401 876 332P
 Injection pump
 Pump designation : PE6P100A820LS130
 EP type number : 0 411 806 179
 Governor
 Governor design. : RSV250...1000P1A532
 Governor no. : 0 421 833 273

Customer-spec. information
 Customer : ENASA

Engine : 9105.07

1st version kW : 105.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.35...13.40

Del.quantity cm³/ : 14.0...14.2

100 s: (13.8...14.4)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 7.9...8.1

Del.quantity cm³/ : 1.8...2.2

100 s: (1.5...2.4)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 140.5...142.5

1000 : (138.5...144.5)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 38...46

Testing:

1st rack travel in: 12.30

Speed rpm : 735...745

2nd rack travel in: 4.00

Speed rpm : 780...810

3rd rack travel in: 4.00
Speed rpm : 790...820
4th rack travel in: 1000
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 19...27
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 5.5

Testing:

Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 250
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00
Speed rpm : 330...390

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 700
Rack travel in m: 13.30...13.40
2nd speed rpm : 450
Rack travel in m: 13.30...13.40
3rd speed rpm : 290
Rack travel in m: 14.60...15.20

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 12.30
Speed rpm : 735...745

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 260.0...280.0
1000 s: (256.0...284.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.90...6.10

Remarks:

:

APPLICATION

Generator set

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : ENA 11,9 g
Edition : 09.11.89
Replaces : 16.6.88
Test oil : ISO-4113

Combination no. : 0 401 876 333

Injection pump
Pump designation : PE6P120A320RS257
EP type number : 0 411 826 075
Governor
Governor design. : RSV250...1100POA533
Governor no. : 0 421 833 274

Customer-spec. information
Customer : ENASA

Engine : 96 T1A0

1st version kW : 213.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp., °C : 38...42

Overflow valve
: 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
: (2.75...2.95)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 10.10...10.20

Del.quantity cm3/ : 18.6...18.8

100 s: (18.3...19.1)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 5.7...5.9

Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Del.quantity : 186.0...188.0

1000 : (183.0...191.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 40...48

Testing:

1st rack travel in: 9.10

Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1170...1200
3rd rack travel in: 4.00
Speed rpm : 1170...1200
4th rack travel in: 1350
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever

position degrees: 15...23

Setting point w/out bumper spring

Speed rpm : 250

Rack travel in mm : 5.3

Testing:

Speed rpm : 100

Minimum rack trave: 19.50

Speed rpm : 250

Rack travel in mm : 5.70...5.90

Rack travel in mm : 2.00

Speed rpm : 330...390

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1050

Rack travel in m: 10.00...10.20

2nd speed rpm : 450

Rack travel in m: 10.10...10.20

3rd speed rpm : 300

Rack travel in m: 11.30...11.90

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.10

Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 140.0...160.0

1000 s: (136.0...164.0)

Rack travel in mm : 19.50...21.00

Remarks:

:

APPLICATION

Ship

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 g
 Edition : 09.11.89
 Replaces : 30.9.88
 Test oil : ISO-4113
 Combination no. : 0 401 876 336
 Injection pump
 Pump designation : PE6P120A32ORS415-1
 EP type number : 0 411 826 123
 Governor
 Governor design. : RSV250...1050P5A539
 Governor no. : 0 421 833 299

Customer-spec. information
 Customer : DAF

Engine : KT 191

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., C. : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 650

Rack travel in mm : 10.80...10.90

Del.quantity cm³/ : 16.1...16.3

100 s: (15.8...16.6)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 6.4...6.8

Del.quantity cm³/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm³ : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 650

Aneroid pressure h: 700

Del.quantity : 161.0...163.0

1000 : (158.0...166.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 46...54

Testing:

1st rack travel in: 9.20

Speed rpm : 1085...1095

2nd rack travel in: 4.00

Speed rpm : 1125...1155

3rd rack travel in: 4.00

Speed rpm : 1150...1180
4th rack travel in: 1320
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 20...28
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 5.8

Testing:

Speed rpm : 100
Speed rpm : 250
Rack travel in mm : 6.20...6.40
Rack travel in mm : 2.00
Speed rpm : 630...730

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1040
Rack travel in m: 10.20...10.40
2nd speed rpm : 650
Rack travel in m: 11.10...11.20
3rd speed rpm : 805
Rack travel in m: 10.80...11.00
4th speed rpm : 850
Rack travel in m: 10.50...10.70

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 600
Pressure hPa : 700
Rack travel mm : 10.80...10.90

Measurement

Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 9.50...9.70
2nd pressure hPa : 310
Rack travel in m: 10.40...10.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 1040
Del.quantity cm³/ : 160.0...164.0
1000 s: (157.0...167.0)
Aneroid pressure h: -
Speed rpm : 600
Del.quantity cm³/ : 130.0...132.0
1000 s: (127.0...135.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.20
Speed rpm : 1085...1095

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 300.0...340.0
1000 s: (296.0...344.0)
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 250
Rack travel in mm : 6.20...6.40

Remarks:

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IFS 23,1 d
 Edition : 15.08.89
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 401 876 337
 Injection pump
 Pump designation : PE6P130A320S521
 EP type number : 0 411 836 044
 Governor
 Governor design. : RSV350...1500POA524
 Governor no. : 0 421 833 256

Customer-spec. information
 Customer : ISOTTA

Engine : ID38 SS-6V

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60
 : (3.45...3.65)

Rack travel in mm : 18.00...21.00

N20

Firing order : 1- 2- 3- 4- 5- 6

Phasing : 0-45-120-165-240-285

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1500

Rack travel in mm : 13.40...13.50

Del.quantity cm3/ : 25.7...26.0

100 s: (25.3...26.3)

Spread cm3 : 0.6

100 s: (1.0)

2nd speed rpm : 500.0

Rack travel in mm : 8.2...8.4

Del.quantity cm3/ : 9.6...10.2

100 s: (9.2...10.6)

Spread cm3 : 1.0

100 s: (1.4)

3rd speed rpm : 500

Rack travel in mm : 7.80

Del.quantity cm3/ : 80.0

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1500

Aneroid pressure h: 900

Del.quantity : 257.0...260.0

1000 : (253.5...263.5)

Spread cm3 : 6.00

1000 : (10.00)

RATED SPEED

1st version

Control lever

position degrees: 42...50

Testing:

1st rack travel in: 12.40
Speed rpm : 1540...1550
2nd rack travel in: 4.00
Speed rpm : 1650...1680
3rd rack travel in: 4.00
Speed rpm : 1665...1695
4th rack travel in: 1750
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 68...76
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.4
Speed rpm : 350
Rack travel in mm : 6.80...7.00
Rack travel in mm : 2.00
Speed rpm : 525...585

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1500
Rack travel in m: 13.40...13.50
2nd speed rpm : 600
Rack travel in m: 13.40...13.60
3rd speed rpm : 400
Rack travel in m: 14.60...15.20

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 13.40...13.50

Measurement

Speed 1/min : 600
Rack travel in m: 12.40...12.50
2nd pressure hPa : 300
Rack travel in m: 12.80...12.90

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500
Del.quantity cm³/ : 215.0...218.0
1000 s: (211.5...221.5)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 12.40

Speed rpm : 1540...1550

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.70...7.10
Del.quantity cm³/ : 20.0...26.0 *
1000 s: (-)

Remarks:

* = Element disconnected at idle for
cylinders 2, 4 and 6.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : ENA 10,1 g
 Edition : 01.12.89
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 401 876 339
 Injection pump
 Pump designation : PE6P110A820LS513-1
 EP type number : 0 411 816 177
 Governor
 Governor design. : RSV250...1000P1A532-1
 Governor no. : 0 421 833 331

Customer-spec. information
 Customer : ENASA

Engine : 95T1B0.MR4

1st version kW : 176.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.20...13.30

Del.quantity cm3/ : 18.8...19.0

100 s: (18.5...19.3)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 6.6...6.8

Del.quantity cm3/ : 1.8...2.2

100 s: (1.5...2.4)

Spread cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 188.0...190.0

1000 : (185.0...193.0)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever

position degrees: 36...44

Testing:

1st rack travel in: 12.20

Speed rpm : 1040...1050

2nd rack travel in: 4.00

Speed rpm : 1085...1115
3rd rack travel in: 4.00
Speed rpm : 1085...1115
4th rack travel in: 1250
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 13...21
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 5.5

Testing:

Speed rpm : 100
Minimum rack trave: 19.50
Speed rpm : 250
Rack travel in mm : 5.40...5.60
Rack travel in mm : 2.00
Speed rpm : 330...390

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1000
Rack travel in m: 13.20...13.30
2nd speed rpm : 450
Rack travel in m: 13.20...13.30
3rd speed rpm : 300
Rack travel in m: 14.40...15.00

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.20
Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 150.0...170.0
1000 s: (146.0...174.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.90...6.10

Remarks:

:

APPLICATION

Ship

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PEN 12,1 b
 Edition : 11.11.88
 Replaces : 9.3.87
 Test oil : ISO-4113
 Combination no. : 0 401 876 756
 Injection pump
 Pump designation : PE6P120A320RS3189
 EP type number : 0 411 826 759
 Governor
 Governor design. : RSV650...750P4/421-3
 Governor no. : 0 421 833 252

Customer-spec. information
 Customer : VOLVO-PENTA

Engine : TD121GG

1st version kW : 199.0
 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.60...2.70
 : (2.55...2.75)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 11.40...11.50

Del.quantity cm3/ : 24.1...24.3

100 s: (23.8...24.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 650.0

Rack travel in mm : 3.3...3.5

Del.quantity cm3/ : 2.0...2.4

100 s: (1.7...2.7)

Spread cm3 : 0.5

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.70

Governor spring pre-tension

Click setting x : 4.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 241.0...243.0

1000 : (238.0...246.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 42...50

Testing:

1st rack travel in: 10.40

Speed rpm : 750...755
2nd rack travel in: 4.00
Speed rpm : 791...804
4th rack travel in: 950
Speed rpm : 0.30...1.70

LOW IDLE 1

Control Lever
position degrees: 35...43
Setting point w/out bumper spring
Speed rpm : 650
Rack travel in mm : 3.4
Speed rpm : 650
Rack travel in mm : 3.30...3.50
Rack travel in mm : 2.00
Speed rpm : 630...690

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.40
Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 480.0...520.0
Rack travel in mm : 20.00...21.00

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : ENA 11,9 i
 Edition : 13.12.89
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 401 876 760
 Injection pump
 Pump designation : PE6P120A32ORS3176-1
 EP type number : 0 411 826 767
 Governor
 Governor design. : RSV250...1100POA533
 Governor no. : 0 421 833 274

Customer-spec. information
 Customer : ENASA

Engine : 96 W1 A0

1st version kW : 250.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp., °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.80...3.90
 : (3.75...3.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - , : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.60...13.70

Del.quantity cm³/ : 24.7...24.9

100 s: (24.4...25.2)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 4.1...4.3

Del.quantity cm³/ : 2.5...3.1

100 s: (2.2...3.4)

Spread cm³ : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 247.0...249.0

1000 : (244.0...252.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 41...49

Testing:

1st rack travel in: 12.60

Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1200...1230
3rd rack travel in: 4.00
Speed rpm : 1200...1230
4th rack travel in: 1350
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 15...23
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 5.5

Testing:

Speed rpm : 100
Minimum rack trave: 19.50
Speed rpm : 250
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00
Speed rpm : 340...400

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 13.60...13.70
2nd speed rpm : 450
Rack travel in m: 13.60...13.70
3rd speed rpm : 300
Rack travel in m: 14.80...15.40

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.60
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 150.0...170.0
1000 s: (146.0...174.0)
Rack travel in mm : 19.50...21.00

Remarks:

:

Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

APPLICATION

Ship